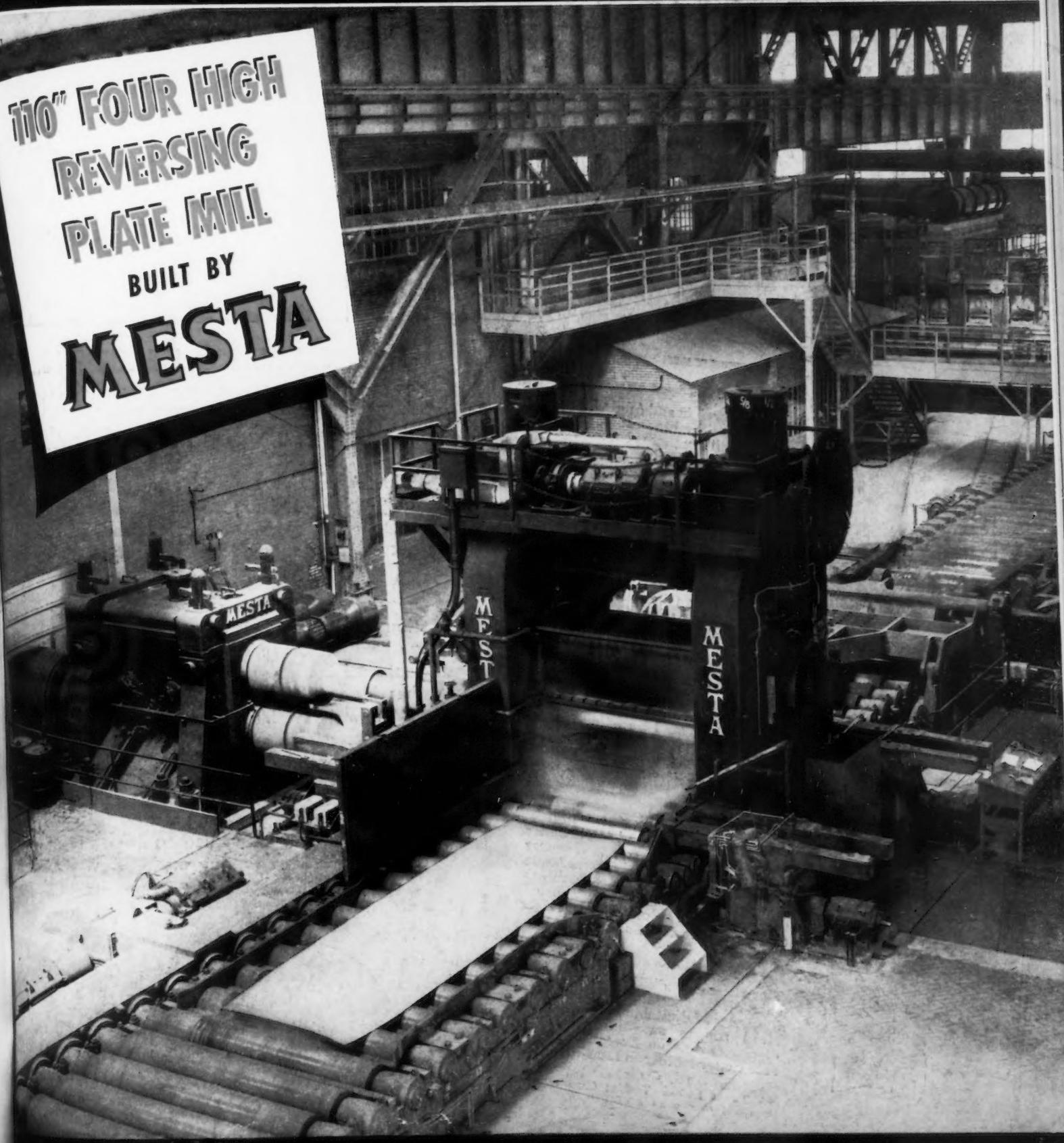


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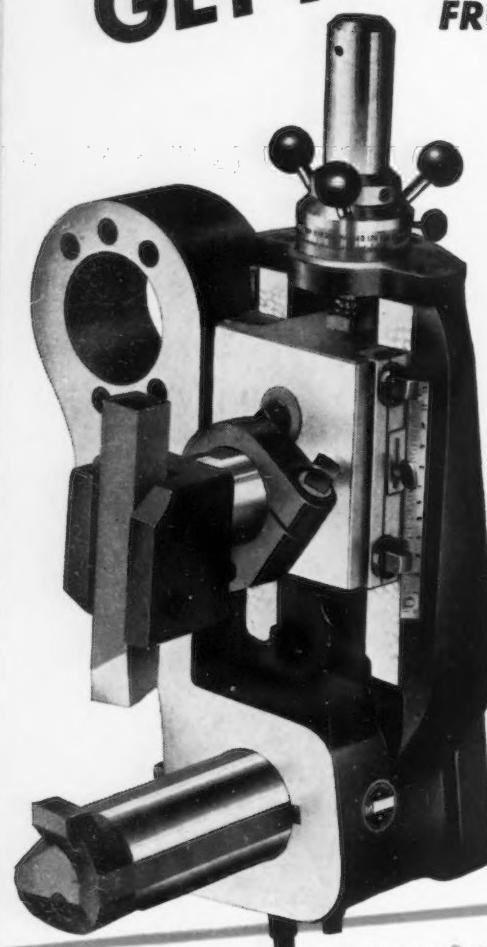
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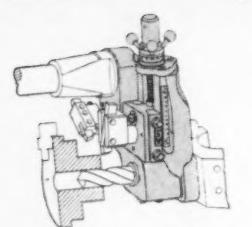
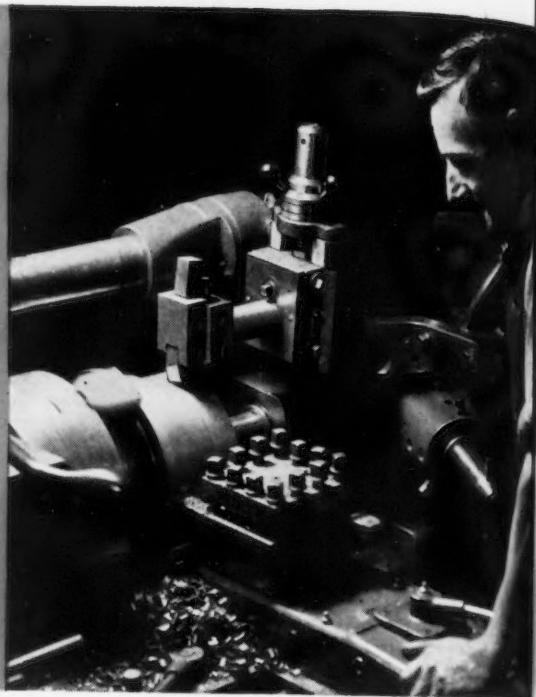


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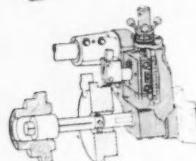


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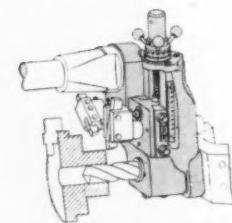
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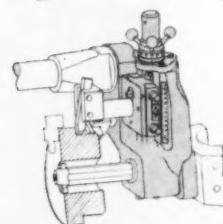
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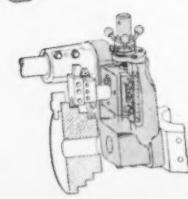
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The extreme flexibility of the Adjustable Single Turning Head is here illustrated. Adjustable Single Turning Head roughs and finishes several diameters with one Reversible Adjustable Cutter Holder in the slide block.

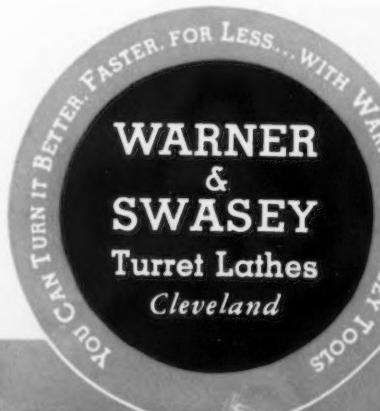
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This Week in . . .

THE IRON AGE

Editorial

Hand-to-Mouth Priorities	51
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Technical Articles

Preparing Metallurgical Specimens	53
75 MM. Shells from Bar Stock to Shipping Doc't	58
Expediting Shell Slug Production	62
Measurement of Residual Stresses in Metals	63
Rectifiers for Electroplating	72
Preview of Iron and Steel Exposition	77

Features

Assembly Line	82
Washington	86
The West Coast	90
Fatigue Cracks	94

News and Markets

This Industrial Week	96
News of Industry	99
Government Awards	128
Personals and Obituaries	138
Construction Steel	140
Machine Tool Activity	144
Non-Ferrous Metals	145
Scrap Markets	146
Iron and Steel Scrap Prices	148
Comparison of Prices	149
Finished Steel Prices	150
Warehouse Prices	151
Sales Possibilities	156

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Products Advertised

Index to Advertisers	200
----------------------	-----

237

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THE IRON AGE

SEPTEMBER 18, 1941

ESTABLISHED 1855



Hand-to-Mouth Priorities

REMEMBER the days of "hand-to-mouth" buying, during the depression? There was no question then of bottlenecks, shortages or excessive inventories.

It took a good deal more purchasing and planning skill to buy on this "hand-to-mouth" basis than it would have to hand out orders covering requirements for a year or six months. But that was when planning and careful buying had to be done to reduce interest on investments in raw materials and stocks in process. It needed all of the skill that management could summon in those days to keep a concern's head above water.

A lot of little concerns in our industry, as well as big ones, survived the storm because of the judicious exercise of these economies. But that was in the days when private enterprise did the buying. It had a personal interest in self-preservation.

Today buying orders virtually come from Washington. Private initiative, it is true, actually still does the purchasing, but it cannot buy when the Government refuses it priority. And today many concerns, whose products cannot be directly connected to defense orders, but which nevertheless are essential to either a war or peace economy, find their very existence threatened by the fact that priority orders have been used in Washington to take the place of planning.

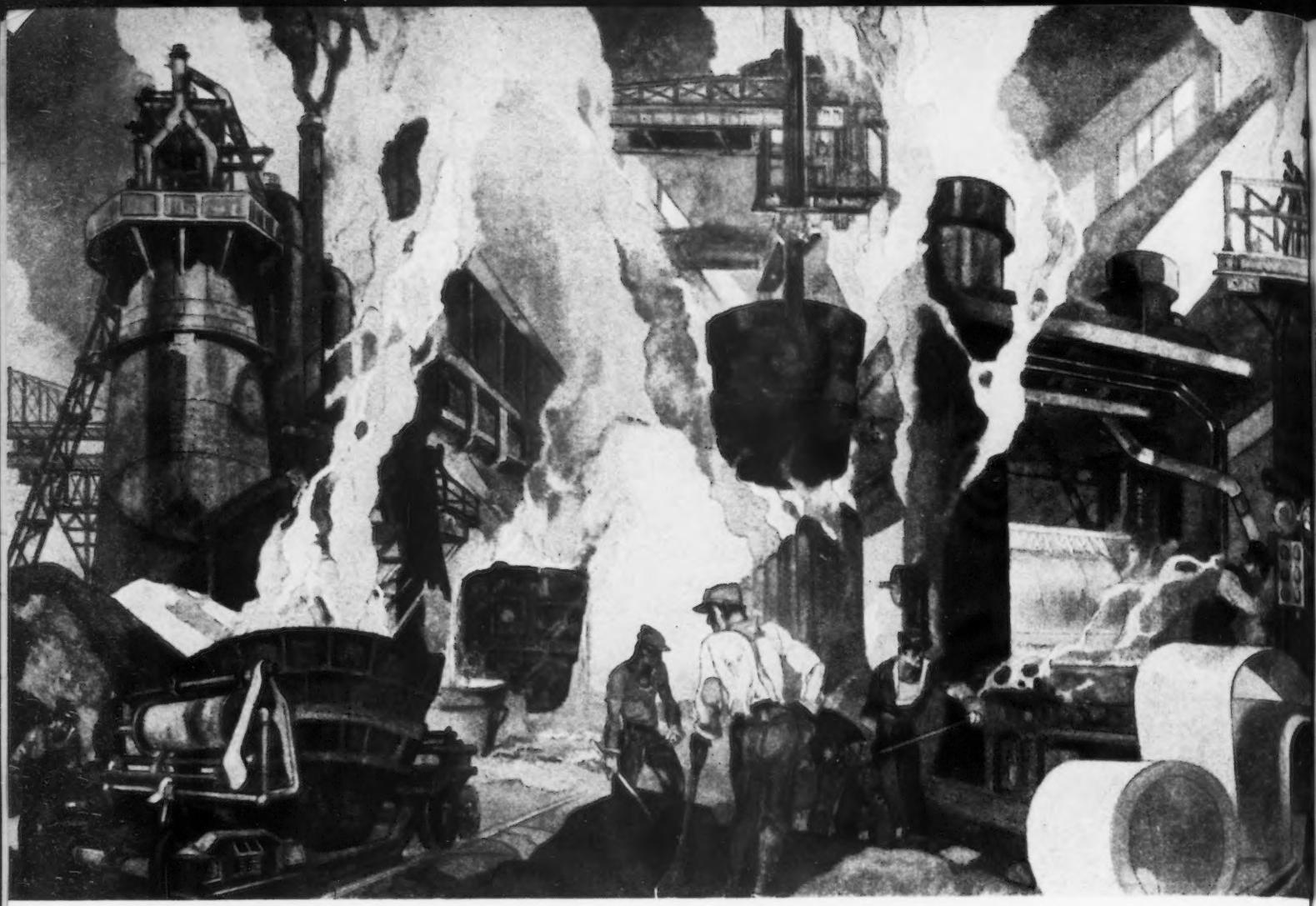
Instead, therefore, of depending for their survival on the way in which they do their own buying, these concerns find their very lives dependent on the way in which Government does its buying. And I fear that Government has a more remote interest in the survival of these industrial concerns than did private initiative.

Priorities are like policemen's nightsticks. They serve a useful purpose when absolutely needed and when wielded in the proper hands. But tossed broadcast to the mob, they promote disorder.

When priorities are handed out, as they have been, as an easy way to avoid the much harder work of planning deliveries in accordance with needs, they are nothing more nor less than big sticks in the hands of a mob. They produce shortages and bottlenecks. They cause people who need material and should have it to go without it because more fortunate people who have been given big sticks demand everything at once and come near getting it, too.

I think we would be better off, for defense work and peace work too, if we had fewer priorities. And if those that we have to have were administered on the "hand-to-mouth" principle instead of on the wholesale basis. If we haven't enough of the right kind of help in Washington to plan needed deliveries on the "hand-to-mouth" basis, we ought to get it there.

It would save many a non-defense plant from going out of business, without depriving defense of what it needs, when it needs it.



MAKING STEEL—a mural painted by the eminent artist Edward Trumbull for Inland Steel Co.

Inland Murals Tell Dramatic Story of Steel

This mural is one of four painted for Inland Steel Co. as a part of the new iron and steel exhibit at the Chicago Museum of Science and Industry.

It portrays the making of steel—the "master metal" which is the foundation of America's industrial advancement. Dramatically expressed are the massiveness and intricacy of modern steelmaking equipment—machinery that daily digests thousands of tons of raw materials, and yields thousands of tons of finished steel. Equipment that embodies the genius and skill

of generations of engineers, metallurgists and steelmakers.

Represented also are the important and varied parts played by men—skilled steelmakers who direct and control the processes and equipment, producing steel of highest uniform quality.

This mural and the three others in the Chicago Museum of Science and Industry are a tribute both to the master metal, so important to America's cause, and to the men and machines who make and shape it to our uses.

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Preparing Metallurgical Specimens

By BETH WALSH

Research Laboratory, General Electric Co.,
Schenectady

THE many variations of the basic method of preparing specimens for metallographic inspection are usually quite satisfactory, but the manner in which they are carried out has often given bad results. The primary consideration in polishing is to proceed through graded and successively finer abrasives until the final polishing leaves a scratch-free surface. Unfortunately, however, a surface that is free from scratches is not always a well polished one because surface flow due to improper polishing may be concealing sub-surface scratches.

This may be illustrated by a comparison of metallographic polishing to buffing. In the latter, a mirror-like surface is obtained by the polishing action of fine abrasives but requires considerable pressure to give a surface flow. Metallographic polishing, on the other hand, requires a mirror-like, scratch-free surface with little or preferably no flow of surface metal. If the surface layers are removed from the buffed sample, scratches will be revealed, while a good polish reveals, on the surface, the true structure of the metal. The same kind of result as that obtained by buffing occurs each time a step in polishing is overlooked or poorly

THIS simple, practical method of preparing specimens for metallographic examination can be used in small laboratories where facilities are limited; or, it can be a basis for general procedure in a large laboratory. In the latter instance, it may be desirable to enlarge upon or vary the methods outlined here to suit the needs peculiar to the user.

finished. Care must be exercised in each polishing step to completely remove the preceding abrasive marks before proceeding to the next step.

When any metal, either hard or soft, is cut in preparation for microscopic work, surface flow occurs, resulting from the metal deformation caused by the cutting action. This flowed surface must be removed, first by carefully polishing the specimen, and second by correctly etching its polished surface. It is not necessary, however, to work slowly in order to achieve a good polish. Many samples of excellent polishing have been made in a very few minutes.

Equipment

The attainment of a satisfactorily polished metallographic sample depends to a large degree on the utilization of properly designed polishing equipment and methods such as those described in the following paragraphs.

For the initial surfacing, a coarse belt grinder is used on which the belt travels in a horizontal posi-

tion. By using a belt in a horizontal position, it is possible to keep the sample more nearly flat by working down the belt rather than holding a sample up against a wheel which is vertically operated.

The polishing wheel is also horizontal and rotates clockwise when looking down upon it. This is necessary to protect the operator if a sample slips from the hand during polishing. The operator, working on the nearside in a more comfortable and, therefore, a more satisfactory position, should be seated while working. In this position, it is possible to hold the sample evenly on the polishing disk.

Retaining rings hold the papers and cloths on the polishing disk. The periphery of the disk is beveled, and the retaining rings are beveled on the inside. This wedge action holds paper and cloths tightly around the edge of the disk. The edge of the disk should not be used in the polishing operation since it is not perfectly flat.

The speed at which the wheel rotates can be varied between 700 and 1150 r.p.m. by means of resis-



THE polishing wheel is in a horizontal position and rotates clockwise, thus permitting the specimen to be held flat against the polishing paper or cloth. During the polishing, the specimen is worked radially from the center of the disk toward the outer edge.

tances and a combination of 110 and 220 volts so that, at low speeds, a high torque is maintained. The spindle of the polishing disk is held in perfect alignment by the ball-bearing races so mounted as to take all radial and thrust actions. The motor, $\frac{1}{4}$ hp., 1150 r.p.m., 220 volt d.c., is mounted with a vertical shaft directly below the polishing head and drives the polishing spindle through a slip coupler and thus prevents any vibration being transmitted to the disk. The polishing disk is recessed on the bottom side in order to fit onto the driving disk, the rotating motion being transmitted by two locating pegs. The top of the polishing disk is sufficiently below the top of the bowl to catch the spray from the wheel during operation. The polishing head is recessed in a cast aluminum bowl in the center of each compartment of the polishing table. The bowl is inclined at the bottom toward a drain placed in the back which extends to a sediment tank on the floor, into which used abrasives and liquids flow. The flow is slow enough to allow most of the abrasives to settle out, and the overflow liquid continues on

down a drain. This helps to prevent clogging the drains.

In general construction, the stainless steel polishing table resembles an ordinary roll-top desk, with a sliding cover to make it easier to keep the entire table top clean by completely enclosing it rather than by using just a lid cover over the wheel itself. The

lubricants used in polishing are prepared as needed and used from stainless steel beakers which are kept on the shelf of the polishing bench at all times other than when the disks are being changed. Because of the hazard of samples being thrown out of the operator's hand, glass equipment is not permitted near the polishing wheel.

Materials

The essential materials used in this method of polishing may be described as follows:

In the rough grinding on the belt grinder, two grades of belts are employed. First is a 50-grit belt, which is followed by a second belt of 120 grit.

In proceeding to the polishing wheel, Nos. 1, 0, 00, and 000 emery papers are used. These are followed by a semi-final or airplane cloth and a fine cloth which is of a two-way, heavy-nap material.

Lubricants are used on all the emery papers as well as on the coarse and fine polishing cloths. For the emery papers, the lubricant is a mixture, about 50-50, of a thin lubricating oil and kerosene.

Experience has shown that distilled water is the best base for all semi-final and final polishing.

A high-quality, filtered liquid soap is used in small quantities with the distilled water during the polishing of some specimens.

An excellent abrasive for the semi-final polish is 600-mesh aluminum powder, which is of uniform texture and quality. The abrasive powder which gives good final polishing results is a commercially

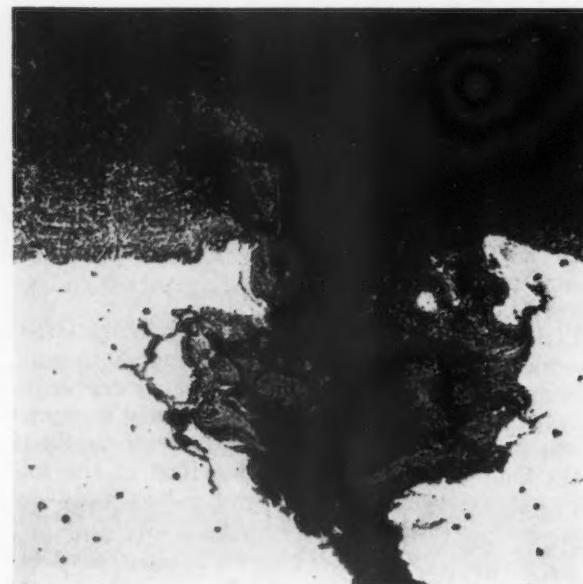


FIG. 1—Unetched specimen of oxide coating on Fe-Ni alloy, 100 diameters.

available magnesium oxide compound. It is ready for immediate use and does not need to be levigated.

For the final cleaning, the sample is washed carefully in water, rinsed with alcohol, and dried in an air blast. This air blast, of some 30 lb. pressure, has been run through a filter tube to remove any dirt and most of the moisture.

Preparation of Samples

The polishing operation actually begins with the cutting of the metallographic sample from its gross matrix because if proper care is not used, the flow and the heat which are present during this operation will damage the specimen so that its true structure is not in evidence, even though the following steps are carefully carried out. Therefore, careful cutting is an aid to easier polishing.

After the sample has been mounted, it is ready for the first step in

"Cibanite Mountings for Metallurgical Specimens," THE IRON AGE, July 24, 1941.

the polishing procedure, which is carried out on the belt grinder, using coarse and fine belts. It is vitally important that the sample is perfectly flat when it is removed from the fine belt. If not, trouble will arise during the rest of the polishing procedure. When specimens of many different metals are to be inspected, it is advisable to use different belts and abrasive papers for each of them. That is, it is not good practice to use a belt for steels, that has been used for lead, solder, or other soft materials which readily clog the paper.



THIS is the disassembled polishing table, showing the pegs in the drive wheel that fit into the polishing disk. A beveled ring that fits around the polishing disk holds the polishing papers and cloths firmly in place on the disk.

If this suggestion is followed, it is possible to lengthen the useful service of the grinding belts and polishing papers.

Each step of the polishing process should be done at a 90-deg. angle to the previous step. If this is done, it is possible to see when the scratches from the preceding step have entirely disappeared. Finer scratches following directly the line of coarser ones are likely

not to erase the coarser ones, but often serve only to widen them, thus ruining the idea of polishing, which is to completely remove each set of scratches.

Following the belt grinder, the samples are taken directly on the polishing disk for the remainder of the work. The steps on the polishing disk follow through the emery papers with the kerosene and oil lubricant. This is applied sparingly to all the abrasive papers while the wheel is in motion. It serves many purposes, but, most important, it fosters the clean cutting action of the abrasives. By so doing, the heating of the specimen is kept at a minimum, even at relatively high speeds; the amount of surface flow is greatly lessened; the cutting is more uniform as to depth and evenness; and it makes the step from the last emery paper to the coarse polishing cloth a less drastic one. The lubrication also helps to keep down the amount of metallic debris and abrasive dust which is thrown from the disk during the paper polishing. All the excess lubricant left on the sample after each step should be carefully cleaned off in order to keep the next paper from being contaminated.

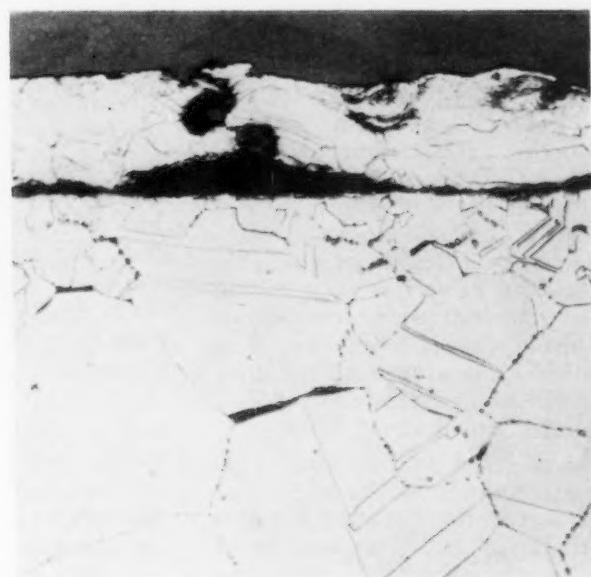


FIG. 2—Embrittled copper, etched with sulphuric dichromate.



FIG. 3—Unetched sample of chrome carbides in a Ni-Cr matrix, 250 diameters.



FIG. 4—Steel inclusion, unetched, 250 diameters.

In each process, the technique should be mastered, and a feeling or "knack" for the correct polishing technique should be acquired.

During the polishing, the sample is worked radially on the disk from near the center to near the outside circumference. It should be examined at frequent intervals to see that the polishing is proceeding satisfactorily and that the abrasive is cutting cleanly. A speed of about 1100 r.p.m. has been found to be quite satisfactory for general work.

After the rough operations are finished, the polishing disk must be removed from the bench and the bench, bowl, and disk thoroughly cleaned with warm water and soap. The stainless steel is easily cleaned, and this task takes only a few minutes. It is also well to remember that the hands should be cleaned as well as the apparatus.

Semi-Final Polishing

There are several cloths and other agents that have been found to give satisfactory results in semi-final polishing. However, over a long period of use, airplane cloth has proved itself to be among the best. It is a hard-surface, no-nap material having a very tight and uniform weave, and either side may be used. Stray dirt cannot hide itself in a no-nap material such as this, and, in automatic polishing, much attention to cleanliness of equipment is necessary. Airplane cloth disks should be kept

in a jar of distilled water containing a few drops of hydrochloric acid. This will keep the cloths soft and pliable.

Although, even after thorough cleaning, this cloth does not seem to be "loaded," abrasive will succeed in remaining in the weave of the material. Because of this, it is not good practice to keep used and unused cloths in the same water. An extremely useful way of keeping all cloths separate is to use quart bottles cut off just below the neck and with the cut edges ground down. Several of these may be placed together and a single glass cover used for all of them. These bottles are easy to keep clean and may be kept on the back of the sink where they are readily accessible.

The abrasive may be used directly on the cloth or in an aqueous suspension. For ordinary polishing, the alundum is rubbed directly on the wet airplane cloth *in small quantities*. The abrasive-bearing cloth is lubricated from time to time while the disk is in motion by dropping distilled water containing a few drops of liquid soap onto the cloth. The sample is held on the wheel and rotated *in the fingers* while the disk is in motion. This rotation gives a uniform polishing action in all directions and prevents "cattails" and dragged surfaces.

The preparation of specimens for the examination of inclusions or hard segregations is varied slightly at this point. The amount of

abrasive on the cloth has to be kept at a minimum. The cloth should also be kept considerably drier than ordinarily. In order to accomplish this, the alundum is mixed with the distilled water and applied to the moving disk with a small paint brush. The disk is allowed to run and partially dry before proceeding with the polish. This method, although somewhat longer, is far more satisfactory. In fact, in some inclusion work, it is possible to inspect steel specimens directly from this cloth.

Final Polishing

A polishing cloth which has polishing characteristics similar to the old French "Kitten's Ear" cloth yields excellent results in final polishing. It is durable and it may be used for either hand or mechanized polishing. It has a very fine texture and a strong and durable backing. Experience has shown that this cloth should be boiled in distilled water until the stiffness is removed and shrinkage is completed. This lessens the durability somewhat, but, considering the results obtained, it is more than worthwhile. As in the case of the cloths for the semi-final polishing, these cloths should be kept in acidified distilled water at all times. As before, new and used cloths should be kept in the separate containers at all times. All used cloths must be thoroughly cleaned each time to remove dirt and abrasives.

It is also advisable to prepare extra cloths ahead of time. Since boiled cloths are ripped very easily by a sharp edge, a too firmly held sample, or a wrinkled cloth, polishing will be delayed if new cloths are not at all times ready for instant use.

The procedure in this step of the polishing is similar to the semi-final one. A minimum of pressure should be exerted. Pressure tends to round any specimen, especially those polished on a heavy-nap material. Polishing should be com-

pleted on a fast wheel with only distilled water as a lubricant except in cases of recurring tarnish, as is often true for copper, when a very little liquid soap may be applied.

In Fig. 1, an unetched specimen of an oxide coating on a Fe-Ni alloy is represented. The magnification is at 100 diameters. Fig. 2 shows a section of embrittled copper, etched with sulphuric dichromate. This shows the edge of the specimen, which is very clearly defined. Fig. 3 is an unetched example of chrome carbides in a Ni-Cr matrix.

This magnification is at 250 diameters, and Fig. 4 shows a section of an inclusion in steel, unetched and magnified 250 diameters.

While there are other variations of this general polishing method for preparing metallographic specimens, this simple, practical method can be used even where polishing facilities are limited. The various jobs which arise in a large laboratory give rise to a need for a general procedure which may be enlarged upon or varied to suit individual cases.

Electrical "Firsts" at New Cold Strip Mill

THE new five-stand cold strip mill recently put into operation at the Irvin works of the Carnegie-Illinois Steel Corp., at Pittsburgh, incorporates a number of new developments in electric drive and control for steel mills. The new mill is said to be the highest powered cold-rolling mill for tin mill stocks in the world and is capable of being operated at a delivery speed of 3850 ft. per min.

A total of 11,400 hp. is employed to drive the mill. The first three stands of rolls are driven by d.c. motors rated at 800, 2000, and 2500 hp. respectively. Stands four and five are driven by double armature d.c. motors of 2500 and 3000 hp. respectively. The tension reel is driven by a 600 hp. double armature motor.

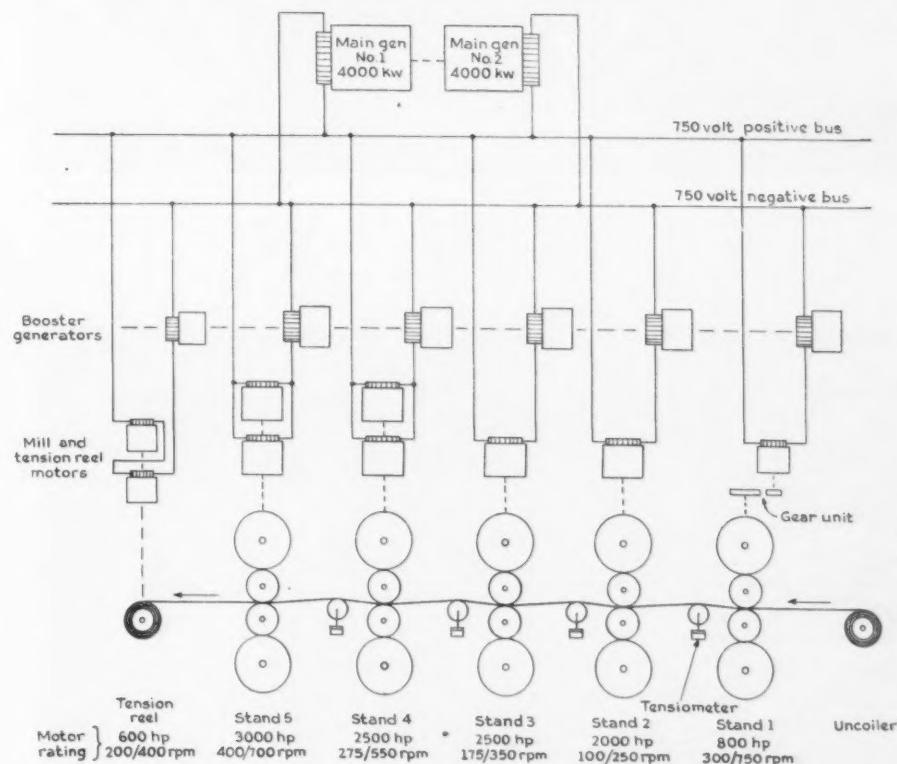
Two General Electric Co. 4000 kw. generators, among the largest d.c. generators ever built, supply the power for the main mill and tension reel motors at 750 volts d.c. To operate the mill at high speeds with fast acceleration and deceleration with metal in the rolls, General Electric precision cold strip mill control is employed. Amplidynes play a big part in this system, handling the various control functions without the aid of other regulators. Amplidyne control of the main generator voltage provides a means of raising and lowering the bus voltage and of maintaining the voltage at a preset value independent of the generator load. An amplidyne exciter controls each of the mill motor booster gen-

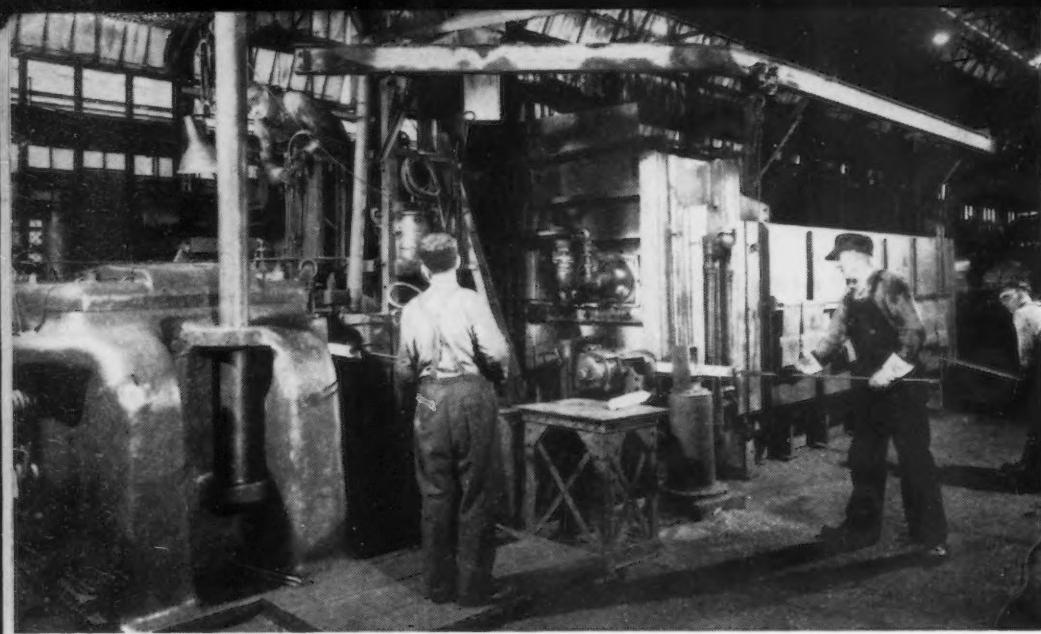
erators, providing for accurate and rapid response of the booster generators to the mill motor load.

A tensiometer is installed between each of the five stands enabling the operators to read the actual pounds of strip tension as the metal proceeds through the mills.

Tapered tension control between the stands enables a more uniform finishing gage at lower mill speeds. Automatically, at low strip speeds, this control system permits the tension on the metal to be increased so that finished strip will be "on gage."

GEneral arrangement of the mill motors and booster generators employed to drive the new five-stand cold strip mill recently put into operation at the Irvin works of the Carnegie-Illinois Steel Corp., Pittsburgh.





75 mm. From Bar Stock

LEFT

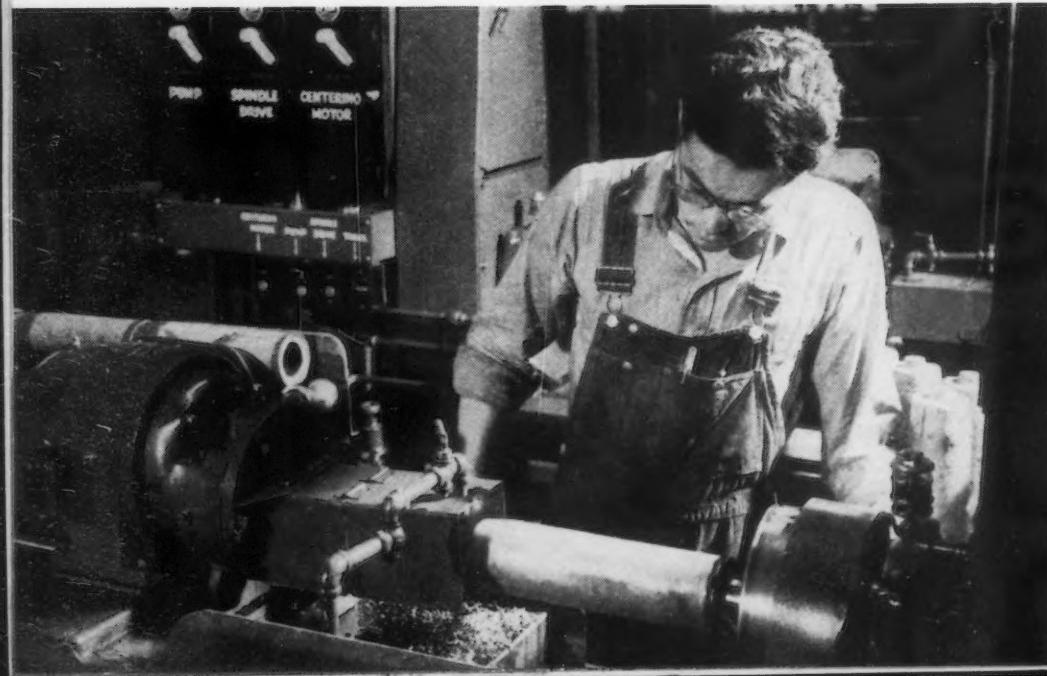
FIRST operation in the production of 75 mm. shells at the International Harvester Co.'s Milwaukee Works is to forge the shell in an upset type forging machine, having five die cavities and piercing tools. Sheared bar stock is heated in the furnace at the right and is descaled by a power driven unit as shown before being upset and pierced.

• • •

CENTER

SHELL forgings are passed through a shot blasting machine on a roller conveyor and then are inspected for outside dimensions and bore before being placed in tote boxes ready for movement to the shell machining department.

• • •



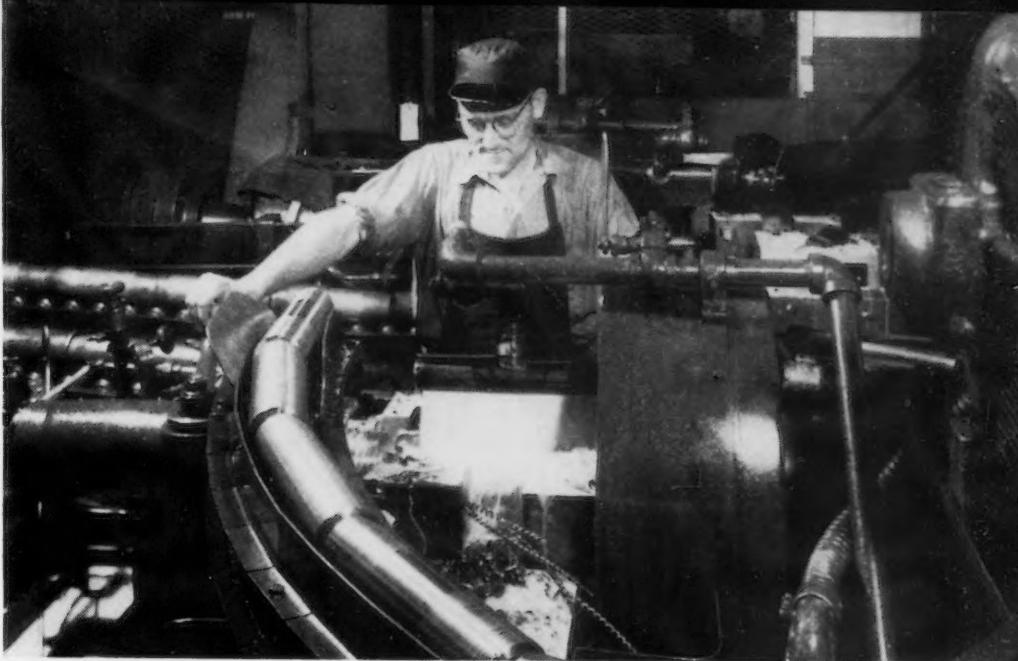
LEFT

FIRST machining operation on the shell is to center drill the closed end. Shell forging is mounted on an expanding arbor and center drill is driven by a gear head motor mounted on the tailstock of the machine.

Shells to Shipping Dock

RIGHT

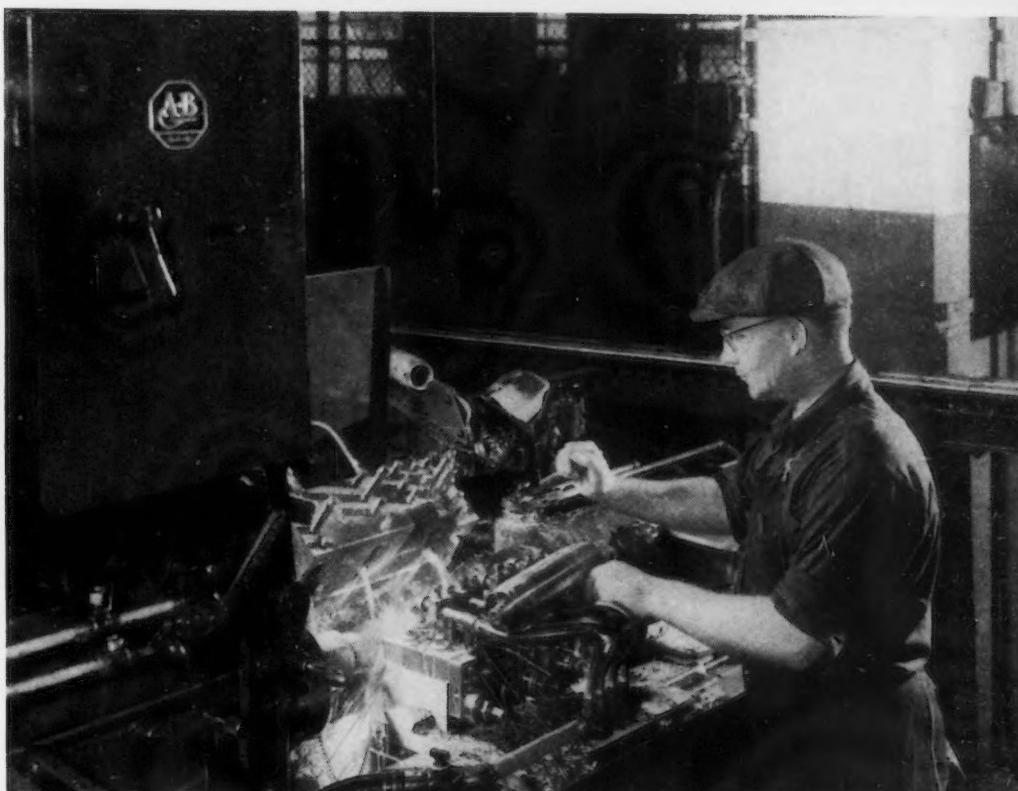
FIRST rough turning operations on the outside diameter of the shell are performed on a Gisholt Simplimatic automatic lathe. Work comes to the lathe on a roller conveyor and is taken away on a second roller conveyor with guides, shown in the foreground.



• • •

CENTER

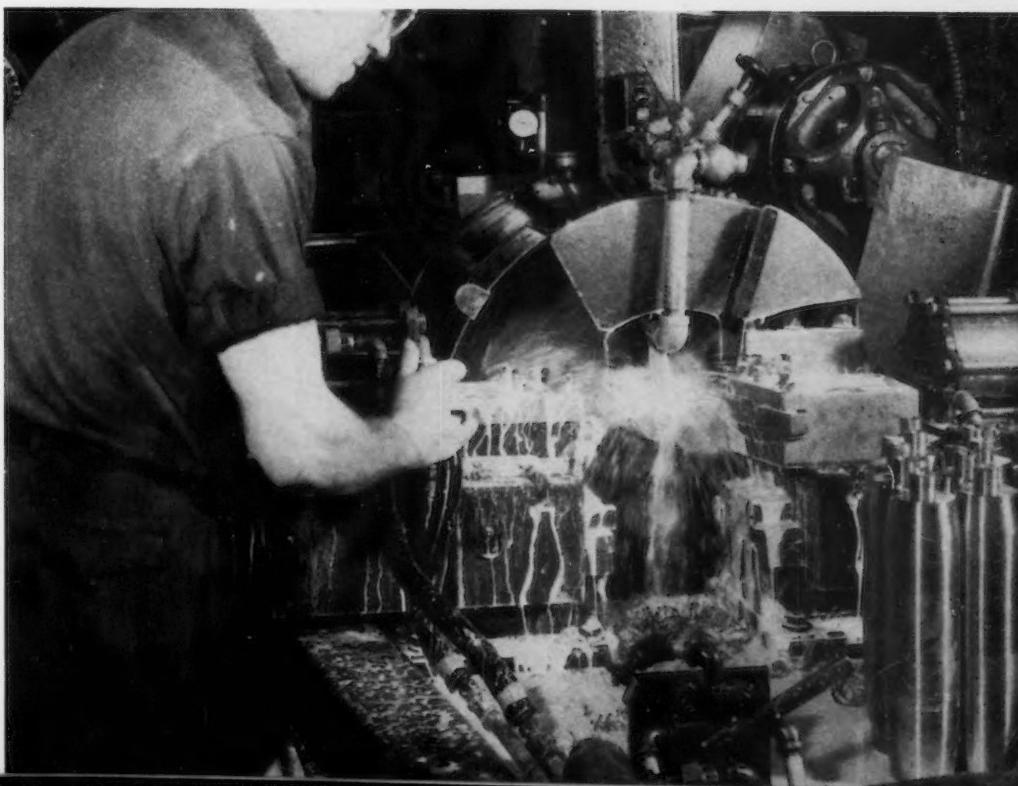
AFTER the open end of the shell has been nosed-in cold in a mechanical press, it is placed in this Fay automatic lathe for finish turning operations, using a multiplicity of tools on both the front and rear carriages. Finished tolerance on the small outside diameter is 0.0035 in.



• • •

RIGHT

SECONDARY finishing operations on the shell include fac- ing the closed end to proper length and grooving and crimping for the copper band which is af- fixed later. This operation on 75 mm. shell is done on Gisholt auto- matic lathes such as the one shown at the International Harvester Co.'s Milwaukee works.



75 mm. From Bar Stock

LEFT

THIS photograph gives an excellent view of the arrangement of gravity roller conveyors used throughout the shell machining department. In the immediate foreground, a Sundstrand hand miller is being used to put four notches in the end of a shell. (The fixture for this operation was described and illustrated in THE IRON AGE, Mar. 13, 1941, p. 47.) To the rear may be seen two combination drilling and tapping machines for the set screw used to lock the fuse plug in the nose of the shell.

• • •

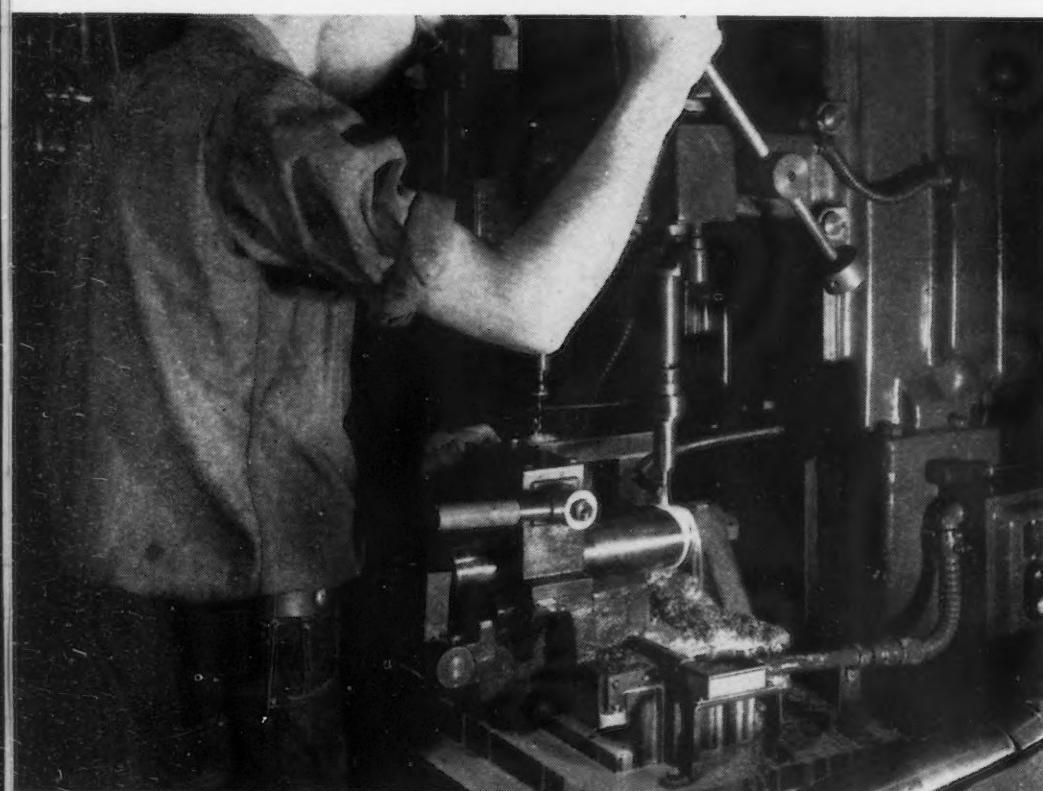
CENTER

CLOSE-UP of the special fixture used to hold the shell while the fuse plug set screw hole is being drilled and tapped. The shell is held in the fixture by two quick-acting cam clamps and the fixture itself is slid on ways from one spindle position to the other.

• • •

LEFT

MULTIPLE spot-welding machine for fastening base cover of the shell to reinforce it against the force of the explosion. Four spot welds are made at once and then the shell is indexed by power to a new angular position. There are two chucks in the fixture so that during the welding operation a welded shell may be removed from the idle chuck and a new one put in its place.



Shells to Shipping Dock

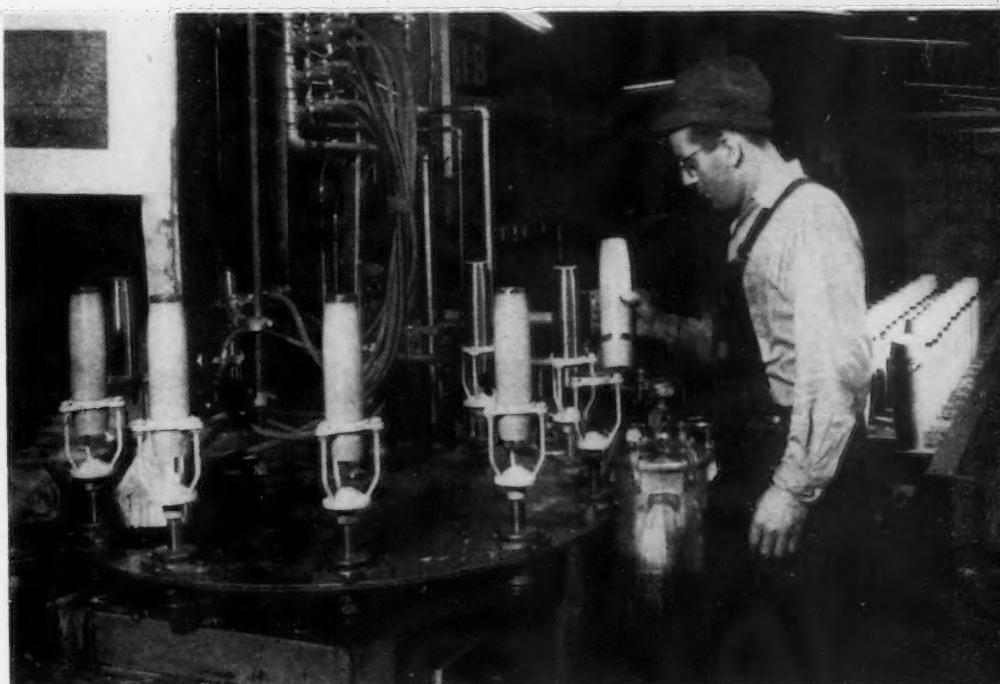
RIGHT

HERE a government inspector uses an Electrolimit automatic gage to check the outside diameters of the shell at seven different places simultaneously. Electric signal lights indicate under or over size, outside the limits set. At the left, the operator also checks the shells for weight.



CENTER

THE exteriors of the shells are painted in an automatic machine of the turntable type, which rotates the shell in the spray position. At the same time the exteriors are being painted, the interiors of the shells are given a spray of lacquer. Shells are held in place by narrow clamps which cover the copper bands.



RIGHT

A VIEW of the shell conveyor line on which the shells are placed to dry after coming from the paint spray. Above and to the rear is combination conveyor and storage unit for the finished shells packed in cartons. It consists of five roller conveyors at different levels. An automatic elevator carries the shell packages to the proper conveyor level and places them on the conveyor where they may move immediately to the shipping dock or remain in storage on the conveyor until such time as a sufficient stock has been accumulated for shipping.



Expediting Shell Slug Production

DURING World War I, the government insisted upon a fractured surface on shell forging billets prepared from bar stock on account of the necessity for closely guarding against defects or pipes in steel. The improved quality of steel available today plus the need for high speed production have enabled abandonment of this restriction. Shell billet stock now is being sheared or sawed with hack saws or cold saws.

A big western Pennsylvania plant handling rounds of X-1340 steel ranging in size from 4½ to 8

in. diameter is using a battery of new type Motch & Merryweather hydraulic feed cold sawing machines, the principal features of which were described in THE IRON AGE, Sept. 19, 1940, page 63. The machine has nine speeds and an interlocking clamping device which prevents the hydraulic feed from being started before the stock has been clamped. One operator runs two to four machines at once.

On X-1340 steel 4¼ in. rounds have been sawed in 30 sec. but for best blade wear 45 to 55 sec. have been recommended, with a cutting

speed of 70 ft. per min. It is estimated that 200 to 250 cuts per sharpening of the saw would result.

On 5½-in. rounds, cuts have been made in as short a time as 50 to 55 sec. On 8-in. rounds, recommended speed is 2½ to 3 min., with cutting speed of 54 ft. per min., yielding 80 to 90 cuts per sharpening. At the western Pennsylvania plant, however, 8-in. rounds have been sawed in as little as 1 min. 42 sec.

Operators merely load the machines. A crane drops the uncut bar stock on rails adjacent to the cold saw and the bars roll onto a roller table, lined up with the cold saw. After the cut has been made a conveyor carries the billets away from the machine.

At a plant in the Chicago district it is estimated that shell slugs from 3¼-in. sq. bars of X-1340 steel can be produced for 2.4c. per slug if the entire equipment is written off in a single year, but this figure does not include labor costs, which probably will be less than 1c. per slug.

Another shell slug job consists of cutting small bars in multiple, as many as eight bars of 1¾-in. diameter X-1314 steel being cut at one time. After loading time of 30 sec., the eight pieces are cut in 45 sec., yielding output of 384 slugs per hr. per machine. One operator runs two machines. Cutting four pieces of 2½-in. diameter stock with the same loading time of 30 sec., can be accomplished in 65 sec. This yields four pieces every 95 sec. or 151 pieces per hr. per machine with one operator running two machines.

With the piece clamped both from above and below and with the saw cutting upward, burrs are eliminated on the new Motch & Merryweather machine. The fact that a uniform slug can be obtained with both ends square is one of the major features of the machine. The bar is set only once for each slug. The machine cuts and returns to the starting position automatically. All the operator does is unclamp, move the work forward to stock stop, which is operated by a foot treadle, and reclamp. The bars or work are never touched by the operator.

MOTCH & MERRYWEATHER cold saw in action at plant of National Acme Co., Cleveland machine tool producer. Saw cuts with an upward motion.



The Measurement of Residual Stresses in Metal

—Methods of revealing the magnitude and distribution of residual stresses in metal products are discussed in this correlated abstract, of which this is the first of two parts.

THE increasing accuracy of machining work and the increasing demands for uniformity of properties have revealed the importance of residual stresses in metal. Attempts are made in the metal industries to eliminate and control the residual stress in high quality products. There will be, therefore, a steadily increasing demand for methods which reveal the magnitude and distribution of residual stresses in products ranging from the largest forgings and castings down to thin wire, tubing, etc.

The presence of residual stresses has been the object of numerous investigations, as such stresses cause warping during machining and contribute to premature service failures, particularly in brasses and stainless steels. Many mechanical methods have been developed to determine the approximate magnitude of these stresses and a few of these methods deal with the rather complicated problem of the actual stress distribution. Recently, non-destructive X-ray stress measuring methods have been introduced and attracted considerable attention. These will be discussed in a later article.

All the mechanical methods are based on the fundamental phenomenon that the removal of a part of a stressed body, usually by machining, causes both the cut-out piece and the remainder to suffer elastic strain. The determination of the internal stresses from these measured strains is a delicate procedure, mainly for two reasons: (1) The residual stresses are triaxial in nature but many methods attempt to measure the strain in only one direction, longitudinally or transverse, (2) the machining operation is the other principal source of difficulty, as the stresses in the region adjacent to the cut are partially re-

moved without corresponding and measurable deformations of the object. Residual stresses determined by methods which include the machined section in the strain measurement have, therefore, been found to be frequently lower than the actual values (see Fig. 7). This is particularly so if high stresses are present.

Removal by pickling can replace machining without being associated with this deficiency, but the pickling method can be used only for thin walled objects such as tubing and sheet. A further fundamental difficulty encountered in determining residual stresses is that of obtaining sufficiently accurate measurements of the small elastic strains. Also, the strains introduced by temperature variations can be higher than the strains resulting from the relief of the residual stresses¹. These numerous complications account for the fact that the results of residual stress measurements are frequently difficult to evaluate.

The assumption upon which all methods of stress measuring is based is that the common elastic equations can be used to correlate the measured strains and the stresses. These equations, correlate, at any point, the three principal strains, e_1 , e_2 and e_3 , with the three principal stresses, s_1 , s_2 and s_3 :

$$e_1 = \frac{1}{E} (s_1 - vs_2 - vs_3)$$

$$e_2 = \frac{1}{E} (s_2 - vs_3 - vs_1)$$

$$e_3 = \frac{1}{E} (s_3 - vs_1 - vs_2)$$

where E is the elastic modulus and v is Poisson's ratio. The values E and v can be obtained from most handbooks, or it may be necessary to determine them from material similar to that being investigated.

These measurements and computations are in their simplest form very elaborate^{5, 6, 7} and often impossible. Many methods, therefore, disregard the triaxiality of the problem and use the simple proportionality between the strain and the stress, in a given direction:

$$e = \frac{s}{E}$$

The Boring Method

A sufficiently accurate method has been developed by Sachs^{8, 9} which permits the determination of the entire stress distribution in circular rods, large solid cylinders, and thick walled tubes having a uniform stress distribution in the circumferential direction. This rather complicated method consists of boring out, in steps, the interior of a cylinder or tube which has a length of at least two or three times its diameter. The diameter of this cylinder in the original condition and after each boring operation is carefully measured at the various reference points on the circumference, with an accuracy of 0.0003 in. or better, Fig. 1. The length is similarly measured, by means of a comparator or micrometer gage, at various designated points on the accurately machined bases, or preferably on the circumference. The two measured unit strains (λ) in the longitudinal direction and (δ)

¹ Bibliography will be published in the second part of the article.

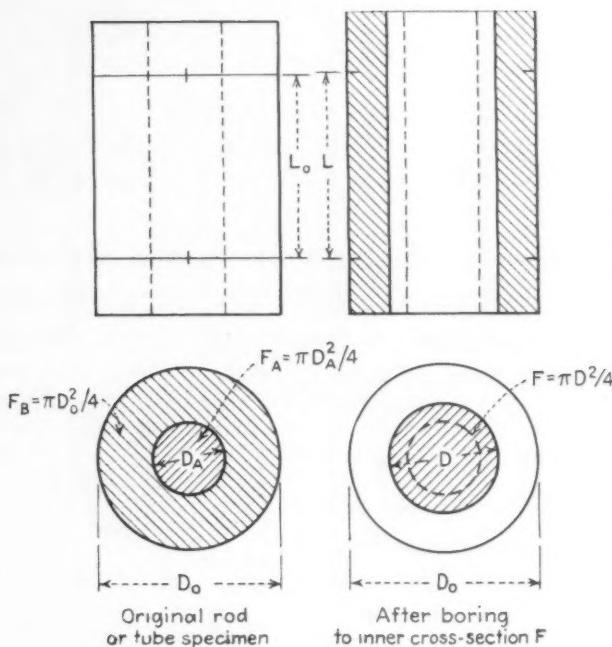


FIG. 1—Diagrammatic representation of the boring method of residual stress determination.

in the circumferential direction, based on the original dimensions, give the stresses according to the following equations, Fig. 2:

$$s = \frac{E}{1 - v^2} \left[(F_b - F) \frac{d\lambda}{dF} - \lambda \right]$$

$$t = \frac{E}{1 - v^2} \left[(F_b - F) \frac{d\theta}{dF} - \frac{F_b + F}{2F} \cdot \theta \right]$$

$$r = \frac{E}{1 - v^2} \cdot \frac{F_b - F}{2F} \cdot \theta$$

where:

s , t , and r are respectively the stresses in the longitudinal, tangential and radial directions after boring out a cross-section area of F ; F_b = the complete cross-sectional area; E = the modulus of elasticity; v = Poisson's ratio,

$$\lambda = \lambda + v\delta, \theta = \delta + v\lambda.$$

In the determination of the strains, considerable care has to be exercised to get measurements at constant temperatures or to correct for temperature changes. The accuracy is appreciably increased if the actual measured strain values are plotted against the drilled cross-section to give a smooth curve, as shown in Fig. 2, and the derivatives (slopes) $\frac{d\lambda}{dF}$ and $\frac{d\theta}{dF}$

taken from these curves.

This method has been used extensively for the determination of the residual stresses in cold worked metals, such as drawn rods and tubes¹⁷, surface rolled steel shafts¹⁸, magnesium propellers¹⁹, heat treated steels^{2, 9, 28, 27}, aluminum alloys²⁸, welded disks^{29, 32}, and shrink fits³³. The largest object which has been investigated so far is a piston rod having a diameter of 10 in. Mea-

surements were carried out with test pieces 44 in. long, according to Fig. 3. The outside diameter was measured with a micrometer every 45 deg. about the circumference at polished and marked points in a plane perpendicular to the rod axis and 12 in. away from each end. To get the changes of the length sufficiently accurate, two gage rings were soldered upon the rod about 8 in. away from the ends. This gage distance of 28 in. was measured at eight marked points about the circumference with a micrometer gage. (In other investigations⁹ the diameter and length changes have been also directly measured during

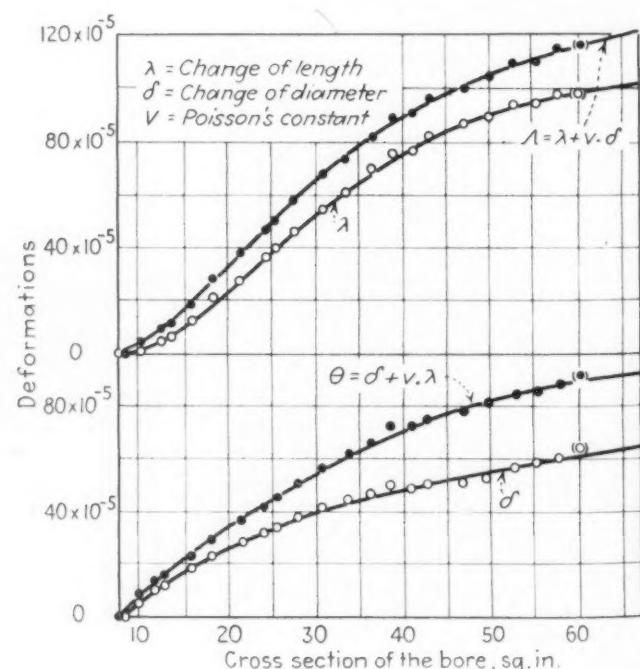
the boring operations by means of common extensometers.) The wall thickness was measured at each end and at eight points.

In taking the actual measurements, it was observed that these figures decreased continuously, corresponding to a slight increase in temperature of the measuring device by the radiation of the human body. Repeating these measurements until these changes remained within ± 0.0001 in. gave reproducible figures.

In a state of rotational symmetry the individual figures of one set of measurements should be identical. In the present case the normal variations did not exceed ± 3 per cent, this showing the state to be one of rotational symmetry. In the few last measurements, approaching a very thin wall of the remaining shell, the variations increased to about ± 30 per cent of the total deformation of 0.6 per cent.

The boring operations were carried out on a large horizontal lathe in small steps using considerable excess of cutting oil to insure cooling. The change of length was followed up during the operation with a dial micrometer clamped to the rod. After finishing a boring operation the dial indicated regularly the decrease of length as the test piece cooled again to room temperature. In order to get the temperature as close as possible to a state of equilibrium, the measurements were taken early in the morning of the next day after the boring operation.

FIG. 2—Length and diameter changes obtained on boring in steps a 44-in. length of hollow 10-in. diameter piston rod.



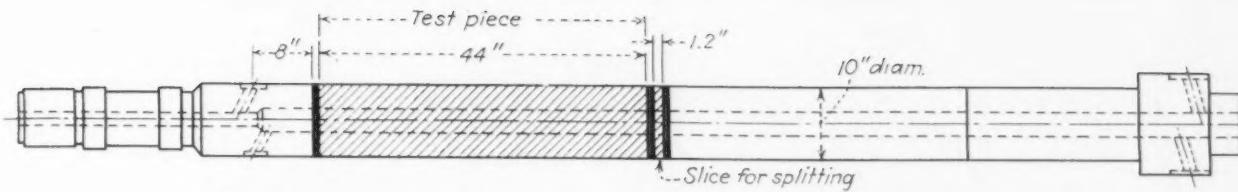


Fig. 3—Scheme of test pieces for measuring residual stresses in a piston rod.

During the entire test the test piece was not removed from the lathe.

The result of the calculation is reproduced in Fig. 4. The longitudinal tensile stresses have their maximum value of 46,000 lb. per sq. in. at a point about 0.6 in. away from the surface of the hole. The tangential tensile stresses have their maximum value of 54,000 lb. per sq. in. directly at the surface of the hole. The radial stresses were not followed up as they are normally of minor importance.

Attempts have also been made to determine the residual stresses in thin walled tubing by this boring method. Fig. 5 illustrates the stresses observed in a tube of normalized S.A.E. X-4130 steel having an outside diameter of 3 in. and a wall thickness of 0.25 in. Fig. 6 shows the stresses found in a tube of the same material having an outside diameter of 1.75 in. and a wall thickness of 0.090 in. The latter measurements are incomplete as the necessary accuracy could not be obtained with the micrometer when the remaining wall thickness was below approximately 0.050 in.

The same method of calculation can be applied to the machining of metal from the outside surface, measuring the change of length (λ) and the change of the internal diameter (δ). However, it is more difficult to accurately measure the inside diameter than the outside diameter. A special device has been developed for the latter purpose which consists of a ball rolling on the inside surface³¹. The formulas

used when machining from the outside are:

$$s = \frac{E}{1 - v^2} \left[(F - F_a) \frac{d\lambda}{dF} - \lambda \right]$$

$$t = \frac{E}{1 - v^2} \left[(F - F_a) \frac{d\theta}{dF} - \frac{F + F_a}{2F} \cdot \theta \right]$$

$$r = - \frac{E}{1 - v^2} \cdot \frac{F - F_a}{2F} \cdot \theta$$

Where F_a is the original cross-section and F the variable cross-section of the material removed.

Approximations for Rod and Plate

Many simpler methods have been suggested for obtaining some evidence and qualitative measure of the residual stresses present in various types of products. However, it must be kept in mind, that the results of the approximation methods may considerably be affected by the machining operation involved and other factors. It appears that the results are less reliable, the higher the magnitude of the actual residual stress, Fig. 7.

The one group of such methods disregards the triaxial relation between stress and strain, but assumes that a simple proportionality between the stress and the strain in a particular direction exists. Thus, in cylinders, the longitudinal stress has been determined very early by Howard³⁵ and later by Heyn³⁶ by turning off a certain gage length (L) in steps, Fig. 8. This length ($L_0, L_1, \dots, L_{n-1}, L_n$) is determined for each step by means of gage marks outside of the turned off length, this producing the cross-sectional areas $F_0, F_1, \dots, F_{n-1}, F_n$.

The resulting stress at each fiber (F_n) is then:

$$s_n = E \frac{F_n \cdot \lambda_n - F_{n-1} \cdot \lambda_{n-1}}{F_n - F_{n-1}}$$

$$\text{where } \lambda_n = \frac{L_n - L_0}{L_0}$$

This method has been frequently used for semi-quantitative stress measurements^{8, 28, 35, 36, 37, 38, 39}. More accurate results are, however, obtained by using a continuous curve⁸, as previously discussed:

$$s = E \left[F \cdot \frac{d\lambda}{dF} - \lambda \right]$$

For a tube with an inner cross-sectional area F_a , the corresponding equation for the longitudinal stress is:

$$s = E \left[(F - F_a) \frac{d\lambda}{dF} - \lambda \right]$$

If a rod or tube is bored out the stress correspondingly becomes:

$$s = E \left[(F_b - F) \frac{d\lambda}{dF} - \lambda \right]$$

where F is the cross-sectional area of the remaining portion of the specimen.

By turning out a piece or slice of a rod or tube and measuring the diameter (D), the circumferential stress (t) and radial stress (r) can be determined according to the following equations^{40, 41}:

$$t = E \left[(F - F_a) \frac{d\delta}{dF} + \frac{F + F_a}{2F} \cdot \delta \right]$$

$$r = - E \cdot \frac{F - F_a}{2F} \cdot \delta$$

where $\delta = \frac{D - D_o}{D_o}$ and D_o is the original outside diameter.

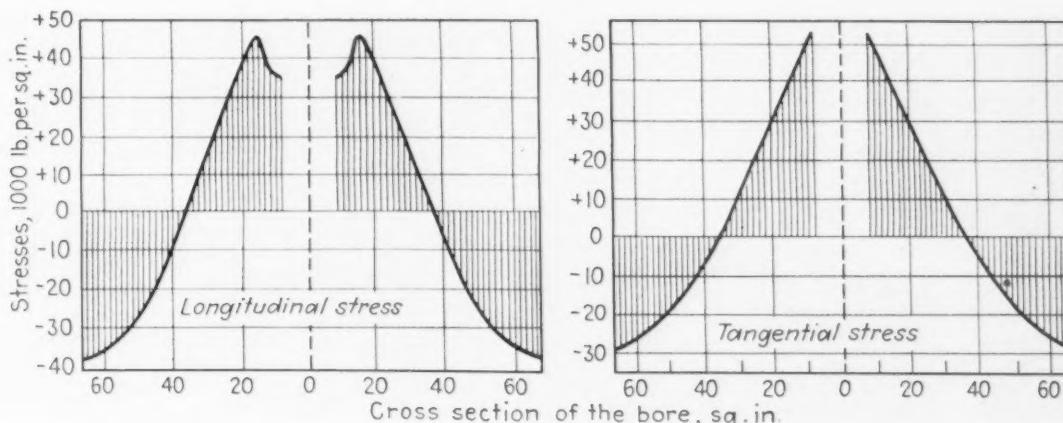
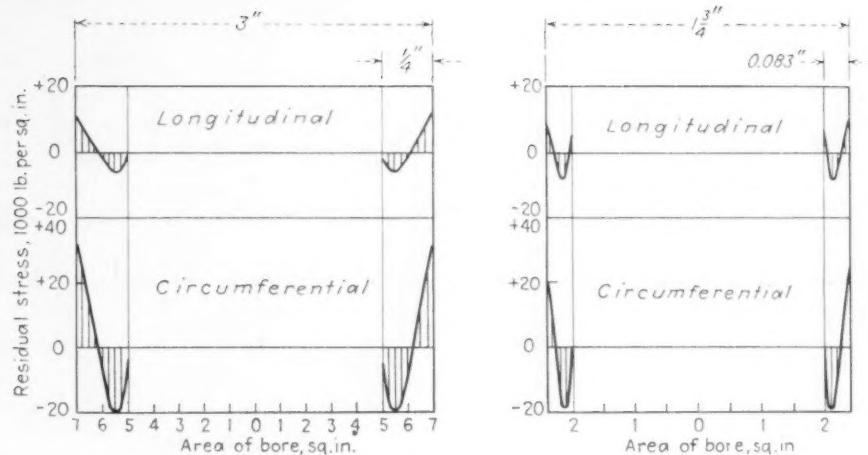


FIG. 4—Residual stresses in a piston rod, as determined by the boring method.



Figs. 5 and 6—Residual stresses in normalized SAE X-4130 tubing.

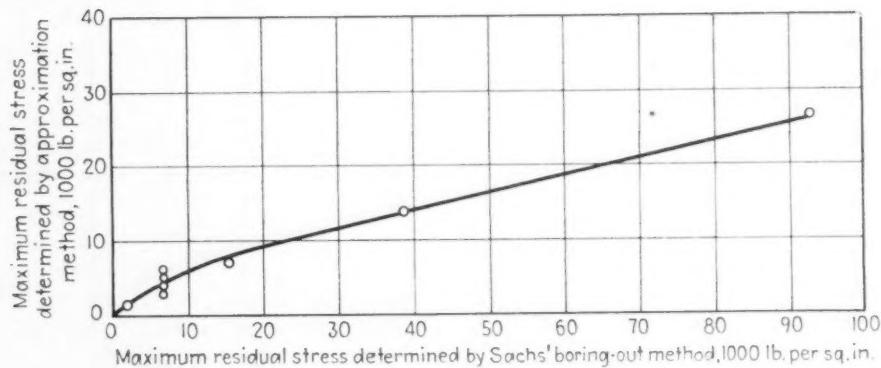


FIG. 7—Comparison of residual stresses in heat treated steel cylinders determined by both the accurate boring method and an approximation method (Buchholtz and Buehler).

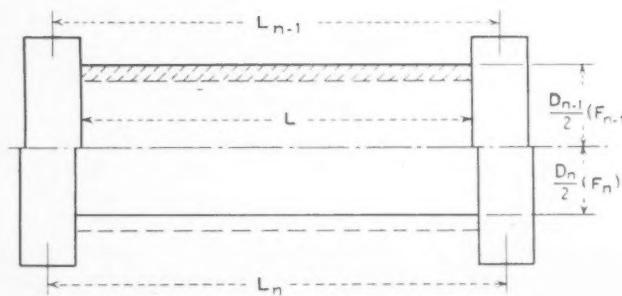


FIG. 8—Diagrammatic representation of the Howard-Heyn method for determination of longitudinal residual stress.

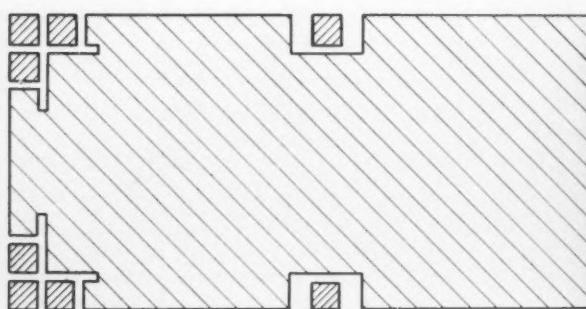


FIG. 9—Diagrammatic representation of local stress determination by machining rings from a large rod.

Stress Measurements of Plates

A similar method has been devised for stress measurements in plates^{42, 43}. Layers are machined or pickled from one side and the deflection of a gage length measured. This method is also used to determine the stress distribution retained in the thin walled tubing, this being described in detail later. If the stress distribution is of a symmetrical type such as in rolled sheet, layers can be taken off simultaneously from both sides³⁸.

If it appears sufficient to determine only the surface stresses, these usually being the most important, a single cut (Δd) from the thickness (d) is sufficient, this giving a deflection (Δf) at the center of the gage length (L). The average stress in the removed layer is then⁴⁴:

$$s = \frac{4E}{3} \cdot \frac{d^2 \cdot \Delta f}{L^2 \cdot \Delta d}$$

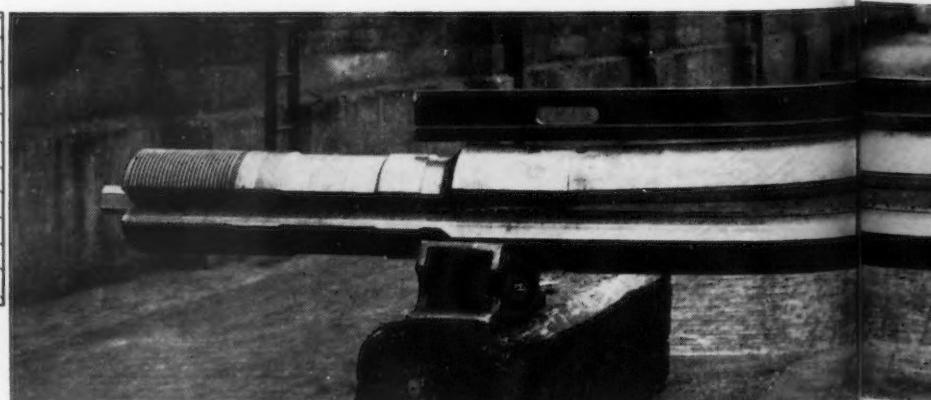
Approximately the same deflection can be obtained by closely spacing saw cuts of the desired depth Δd ⁴¹.

Another group of stress measuring methods is restricted to the determination of the surface stress at a particular point. If a thin strip marked with a gage length (L_o) is machined out, this gage length changes to (L_i) and the stress released is calculated according to the simple equation:

$$s = -E \cdot \lambda, \text{ where } \lambda = \frac{L_i - L_o}{L_o}$$

This also applies to the machining out of a narrow ring from a cylindrical article, Fig. 9, assuming a uniform stress in the circumferential direction. From the observed change of the original diameter D_o to a diameter D_i after machining

Fig. 10—Warping on splitting of a piston



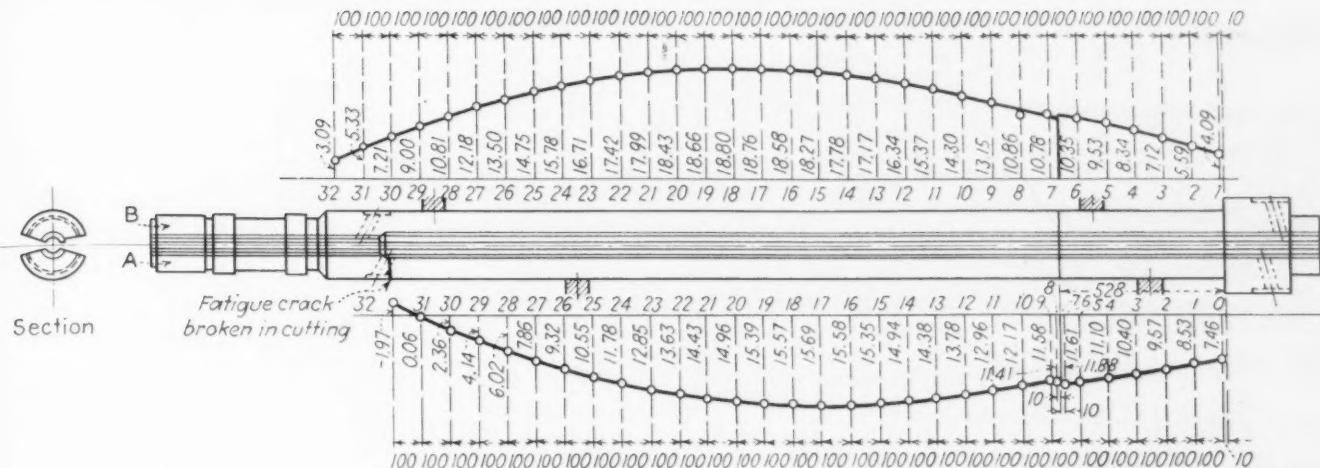


Fig. 11—Accurate measurements (in mm.) of warpage of the piston rod shown in Fig. 10.

the circumferential stress is determined^{40, 45, 46, 47, 48}:

$$t = -E \cdot \delta,$$

$$\text{where } \delta = \frac{D_1 - D_0}{D_0}$$

Using this method, the very first measurements of residual stresses were made by Kalakoutzky⁴⁵.

An approximate measure for the magnitude of the stresses in rods suitable for commercial control, can be obtained by planing or milling a certain gage length down to the center (that is, cutting away all of one side of the rod)⁴⁹ or by slitting it in half.¹⁸ Figs. 10 and 11 illustrate the marked warping on splitting of the previously discussed 10 in. diameter, heat treated crucible steel piston rods which contained high residual stresses. On the contrary, normalized and stress-free open hearth piston rods did not noticeably bend on splitting. Cutting out a segment^{1, 43} may result in an increased bending effect^{1, 50}. However, the results of this method depend upon the width of the segment and in any case indicate only a fraction of the residual stress, particularly

if high stresses are present^{1, 2}. Also this group of methods is based on the assumption that the stress distribution is such that a bending moment is released by the machining operation. The deflection is only a measure for this bending moment from which the stress cannot be calculated without arbitrary assumptions regarding their distribution. Nevertheless, methods of this type have been found to be valuable, particularly for stress measurements in thin walled tubing, and, as mentioned before, will be discussed later in detail. Also, the slitting of a suitable length, Fig. 12, offers a simple method for controlling the stress present in commercial products.

Plates with Varying Stresses

The methods by which surface stresses are measured have been applied particularly to welded plates^{49, 51}. It is assumed in this application that the stresses do not vary over the thickness of the plate. Therefore, the plate can be cut into small pieces, each of which is marked with one or more gage

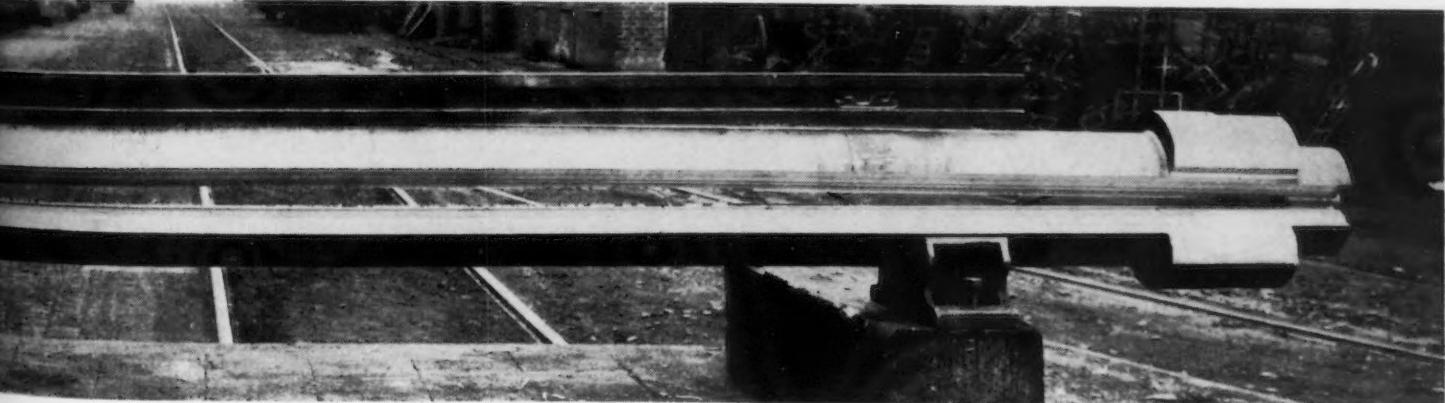
lengths, common practice being to make these 2 in. long. The simplest subdivision method consists of drawing a series of lines parallel and perpendicular to the welded bead at a given distance apart, thus making a network of lines on the surface of the welded structure, Fig. 13. The distances between the intersections or other gage points along the lines are measured by means of sensitive measuring instruments, such as an extensometer^{52, 53} or a comparator^{54, 55, 56}. The welded part is then cut up in small pieces, each containing at least one gage length and the distance between gage points again measured. This way a number of strain values, (λ_1) and (λ_2), are obtained for various points in both the directions parallel and perpendicular to the weld. If the principal stresses (s_1) and (s_2) are in these directions they can be determined according to the equations:

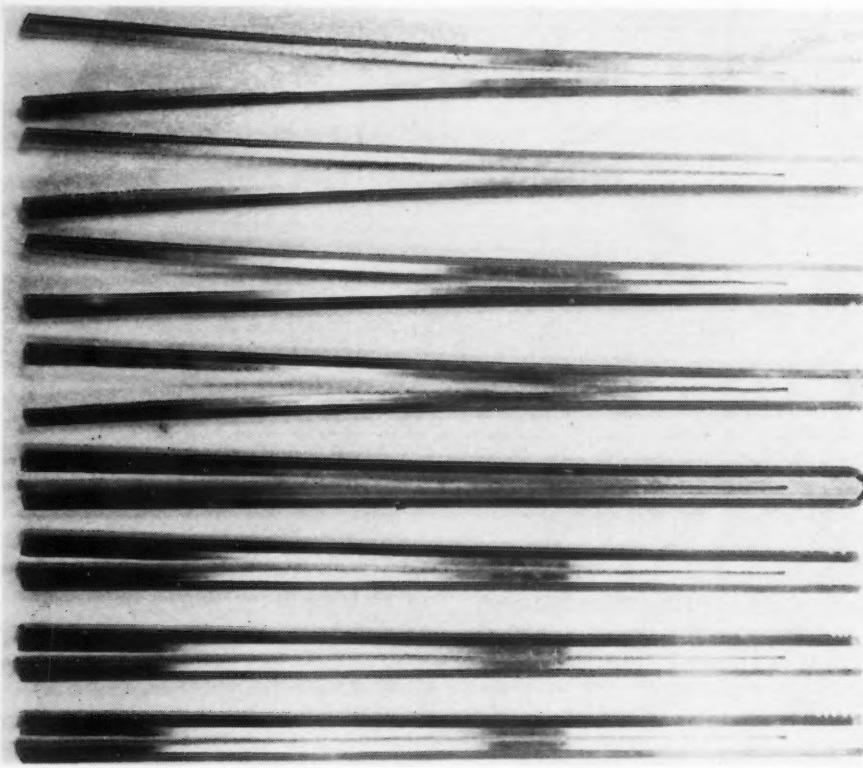
$$s_1 = \frac{E}{1 - v^2} (\lambda_1 + v\lambda_2)$$

$$s_2 = \frac{E}{1 - v^2} (\lambda_2 + v\lambda_1)$$

However, this assumption will

rod which contained high residual stress. Scale, 1:15.





Cold Worked

Annealed:
100° F.

200° F.

300° F.

400° F.

500° F.

600° F.

700° F.

FIG. 12— Warping on splitting of cold drawn hexagonal brass bars, stress relieved at increasing temperatures. Scale, 1:3.

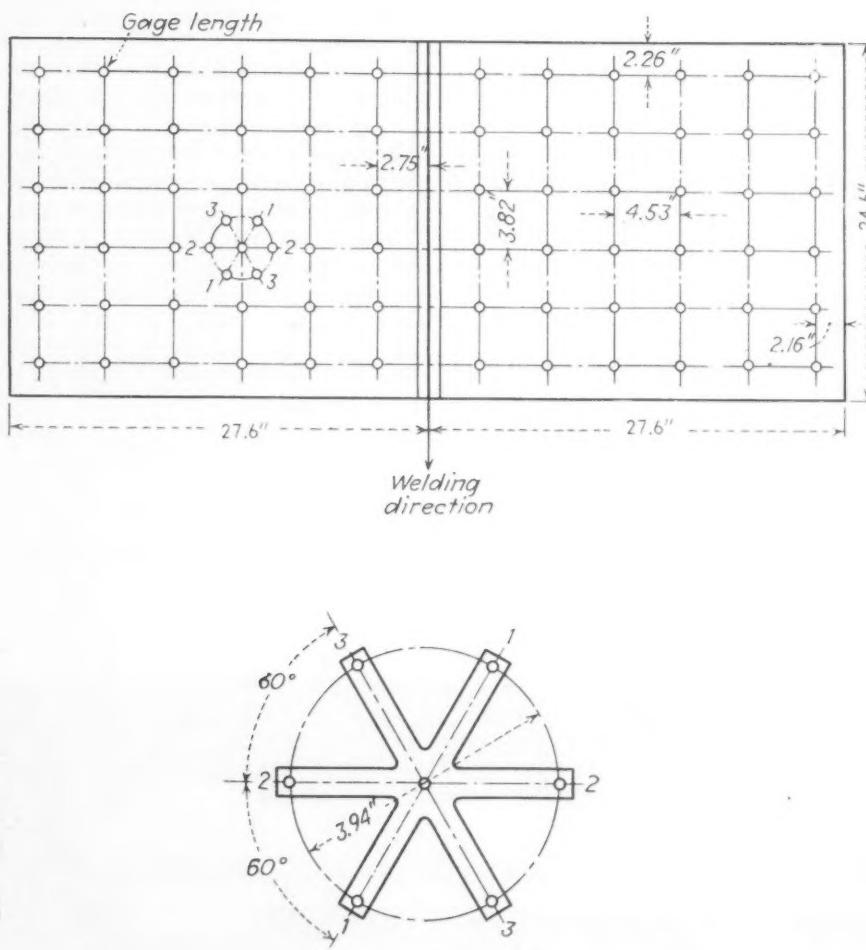


FIG. 13— Diagrammatic representation of welded plate provided with gage points for stress measurements. (Mies).

usually not agree with the actual conditions. Therefore, to determine both the magnitude and the direction of the principal stresses, a star like arrangement of three gage lines, Fig. 13, with common midpoints at 60 deg. to each other^{5, 52} or of four gage lines at 45 deg. to each other^{6, 7} has to be used. The gage lengths are measured first, then a piece containing each set of lines 1-1, 2-2, 3-3, with a common midpoint is cut out and the gage lengths measured again, yielding three strains.

From these strains principal stresses are calculated according to the equations:

$$s_1 = \frac{E}{3} \left(\frac{a}{1-v} + \sqrt{2} \cdot \frac{b}{1+v} \right)$$

$$s_2 = \frac{E}{3} \left(\frac{a}{1-v} - \sqrt{2} \cdot \frac{b}{1+v} \right)$$

where $a = \lambda_1 + \lambda_2 + \lambda_3$.

$b = \sqrt{(\lambda_1 - \lambda_2)^2 + (\lambda_2 - \lambda_3)^2 + (\lambda_3 - \lambda_1)^2}$
and the angle α between the principal stress and the gage line 1-1 is:

$$\tan 2\alpha = \sqrt{3} \cdot \frac{\lambda_3 - \lambda_1}{(\lambda_1 - \lambda_2)(\lambda_3 - \lambda_1)}$$

It is also recommended to start with regions of small stress in order to avoid plastic deformation of regions of high stress. Fig. 14 illustrates the results of this method as applied to a welded steel plate. It is also possible to correct the stresses and to determine their distribution over the thickness by the method consisting of machining layers

from one side in steps and measuring the resulting deflections. Up to the present time, no attempts have been made to determine the effect on the results of the type of cut or the size of the cut out piece.

A method that does not necessarily destroy the tested object has been devised by Mathar^{57, 58}. A hole of about $\frac{1}{2}$ -in. diameter is drilled by means of special drills which avoid distortion of the hole walls, Fig. 15. The changes in diameter of a circle concentric to the hole are measured by means of extensometers; and three holes of a sufficient distance apart, Fig. 15-a, and yielding the deformations in three directions are required for the determination of the direction and magnitude of the two principal stresses parallel to the plate surface. The same objective can be achieved in a simpler manner, Fig. 15-b, by accurately measuring the radial displacement of three points on the circle around a single hole⁵⁸. The relieved stresses can be calculated according to the theory of elasticity, or the extensometer readings are converted to stress by means of a calibration secured on a specimen under known loads. Fig. 16 illustrates the residual stresses in an I-beam determined by this method.

Methods for Thin Walled Tubing

Simple methods can be used for the determination of the residual stresses in thin walled tubing if the stresses consist of high tensile stresses at the one surface and high compressive stresses at the other surface. Such a stress distribution is approximated in *sunk tubing* and in *deep drawn shells*. It is possible to cut sections from such articles in such a manner that a major part of the residual stress is relieved by a bending of the part which is separated from the adjacent metal.

The circumferential stress is evaluated from the change in diameter (d) occurring on splitting a length of tubing, Fig. 17-a^{59, 61, 62, 63, 64} or the cutting out of a circumferential tongue, Fig. 17-b⁶⁰. The bending moment (M) released by such a flexure is:

$$M = \frac{EI}{1 - v^2} \left(\frac{1}{R_o} - \frac{1}{R_i} \right)$$

$$= \frac{EI}{1 - v^2} \cdot \frac{R_i - R_o}{R_o \cdot R_i}$$

where: E = modulus of elasticity,
 v = Poisson's ratio.
 I = moment of inertia of the section,

FIG. 14—Residual stresses in arc weld without restraint. Lines of principal stress. Shaded area is heat-affected zone. Arrow indicates direction of welding. (Mies).

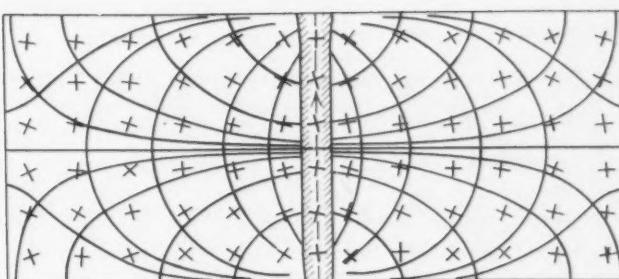


FIG. 15—Two variations of Mathar's method for determination of stresses in structures.

RIGHT

FIG. 16—Residual stress in an I-beam. (Mathar)

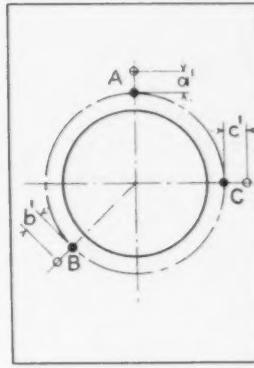
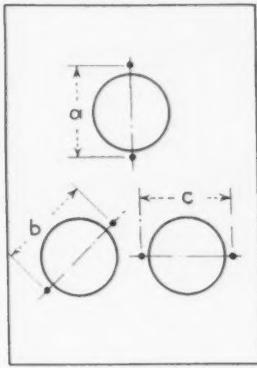
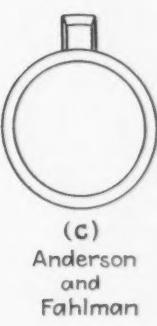
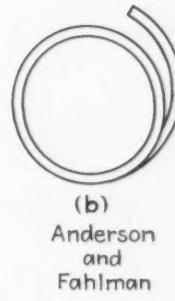
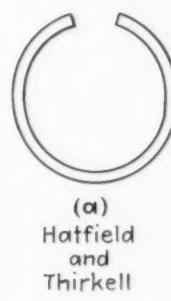
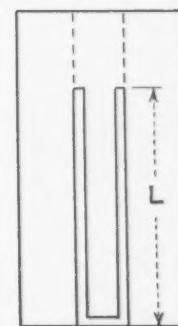
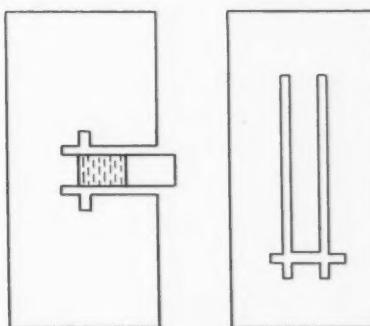
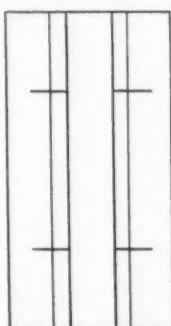
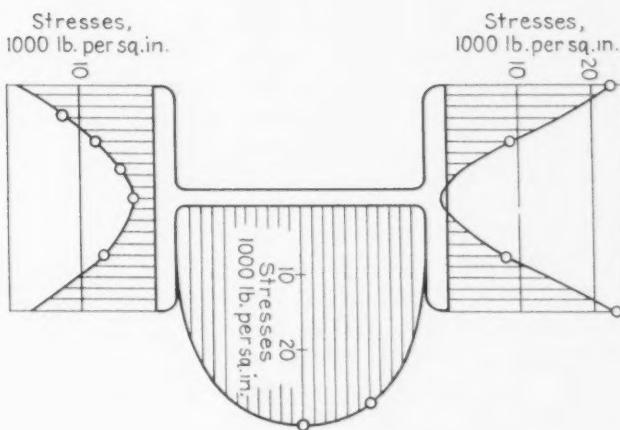
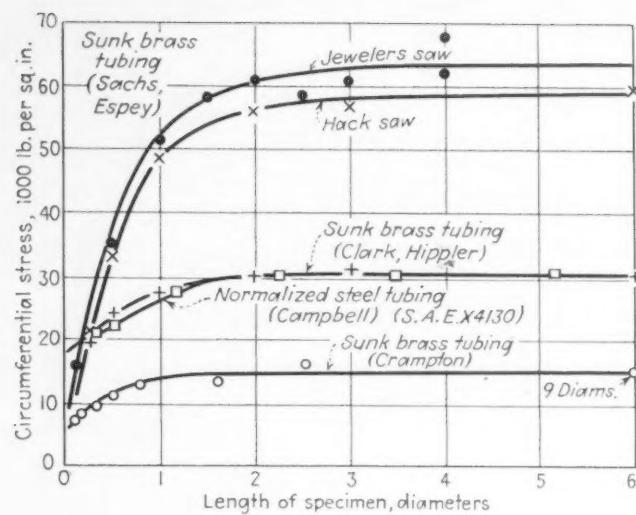


FIG. 17—Diagrammatic representation of methods of testing for magnitude of residual stresses in thin-walled tubing.





R_o = mean radius before splitting,

R_i = mean radius after splitting.

The factor $\frac{1}{1-v^2}$ originates

from the fact that a tube is too rigid to bend longitudinally if subjected to a circumferential bending movement. This rigidity raises, by the above factor, the stresses induced in a wide ring by a certain deflection as compared with the stresses created by the same deflection in a narrow ring.

The release of this bending moment corresponds to the release of stresses, which, in a thin section, vary linearly from one surface to the other and have the following value (S) in a particular fiber a certain distance (x) from the surface:

$$S = \frac{M}{C} \cdot \frac{\left(\frac{d}{2} - x\right)}{\frac{d}{2}} = \frac{E}{1-v^2} \cdot \frac{I}{C} \cdot \frac{\left(\frac{d}{2} - x\right)}{\frac{d}{2}} \cdot \frac{R_i - R_o}{R_o \cdot R_i}$$

$$= \frac{E}{1-v^2} \cdot \left(\frac{d}{2} - x\right) \frac{R_i - R_o}{R_o \cdot R_i}$$

where C is the section modulus and d the thickness of the section, the ratio M/C being $d/2$ for a rectangular section. The maximum stress values at the surface are:

$$S_{max} = \pm \frac{E}{1-v^2} \cdot \frac{d}{2} \cdot \frac{R_i - R_o}{R_o \cdot R_i}$$

For most purposes the simpler equations:

FIG. 18—Effect of length of specimen on residual stress in brass and steel tubing.

deflection of the gage length (L).

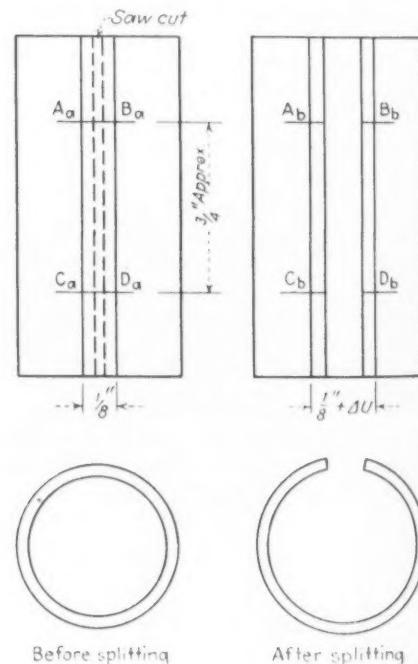
If the residual stresses in a tube have an approximately linear distribution, these methods yield results which permit at least an approximate evaluation of the magnitude in the stresses. They have been used particularly for sunk tubing and drawn shells, but no attempts have as yet been made to evaluate the applicability of the methods.

The calculation of residual stresses in thin walled tubing involves measurements which considerably depend upon the experimental technique.

The two methods of determining circumferential stress, the longitudinal splitting of a specimen, Fig. 17-a, and the slitting of a circumferential tongue, Fig. 17-b, appear to be fundamentally identical. The simpler method of splitting a standard length of tubing has been, therefore, used in the majority of investigations.

According to Fig. 18 the deflection obtained by both methods depends considerably on the length of the specimen.^{62, 65, 66, 67} With a specimen length above three diameters, the deflection becomes constant while with decreasing length the deflection may or may not decrease considerably in an individual case. A length of two diameters, however, will usually yield at least 95 per cent of the maximum deflection. Thus the standard length should be at least two diameters, or still better approximately three diameters. The probable source of the effect of length on this deflection is

FIG. 19—Diagrammatic representation of method of measuring circumferential change of tubing upon splitting.



the presence of longitudinal stress in the tubing which is released by the separating operation. This explains the logarithmic trend and the widely varying magnitude of the effect, Fig. 18, and also the apparent generalization that its extension along the length mainly depends upon the diameter and not the wall thickness of the tubing.

Another factor which reduces the deflection is the cutting operation itself⁶⁷, which plastically deforms the metal in a certain depth from the cut and relieves the stress within this layer of metal. This effect is small, as illustrated by the difference in deflection obtained by using a regular size hack saw and a very fine bladed jeweler's saw, respectively, Fig. 18.

The two methods of determining longitudinal stress differ fundamentally, in that the slitting of a tongue from a tubular specimen, Fig. 17-c, may or may not relieve circumferential stress, while the slitting of a tongue from a previously split specimen, Fig. 17-d, should be little affected by the already relieved circumferential stress. The effect of the method on the resulting deflection has not been

studied as yet. On small size tubing, the former method, slitting by milling, is difficult to apply, while the latter is based on simple sawing operations.

The principal factor in the procedure which effects the longitudinal deflection is the width of the strip^{62, 67} or apparently the ratio of width to the diameter. A maximum deflection is obtained with a width of the tongue between 0.10 and 0.20 of the diameter. Narrower tongues deflect less because of the elimination of the stress by the slitting operation. With increasing width of the tongue, the deflection passes through a maximum and then decreases very fast to small values because of the increasing curvature and stiffness of the tongue.

Taking into consideration the above discussed effects, the following procedure appears to be as simple as possible. On the specimen, two to three diameters long, parallel lines are scribed by means of dividers or a special jig a sufficient distance apart, Fig. 19, to permit cutting between the lines (and in the case of a decrease in diameter, removing of a strip of metal). Also scribed on the speci-

men are two lines perpendicular to and intersecting the longitudinal lines, one half to one diameter from the ends. The distances between the gage points, A, B, C, and D, in the circumferential direction are measured by means of a measuring microscope; the tubing is split and the distances measured again. Their average values are chords and for accurate work have to be corrected in order to transform them into arcs, these arcs being the circumferential change $\Delta U = \pi \cdot \Delta D$, where ΔD is the desired change in diameter.

The longitudinal deflection is then determined by slitting a tongue, 0.10 to 0.20 diameters wide, from the split specimen. The length of the tongue should be close to the total length of the specimen. The end deflection of this length can be accurately measured by means of a measuring microscope, in order to determine the length of the tongue the saw cut should terminate perpendicular to the axis of the specimen.

Ed. Note:—Next week the authors conclude with data on the determination of stresses in thin walled tubing, drawn and spun cups, etc.

Welding Positioner Table

To facilitate welding procedure in the fabrication of flanged pipe nozzles for pressure vessels, the Johnson & Jennings Co., Cleveland, built a low-cost and efficient revolving-tilting welding positioner table, capable of rotating loads up to 1000 lb.

The answer to locating a satisfactory and cheap mechanism for the revolving member of the table was found in the use of a front axle and wheel assembly of discarded automobile trucks. A pin which registers with holes in the yoke plate, controlled by a treadle, permits setting the table at any required angle, while a pressure plate controlled by a spring through levers to the treadle gives the operator full control of revolving the job. The table top is drilled for suitable clamps to hold the job in position.

Material for the construction of this positioner table may be se-

SMALL welding shops, relying on ingenuity instead of capital investment for special and intricate toolings, will find this low cost revolving-tilting positioner table, built by Johnson & Jennings Co., Cleveland, useful on those difficult jobs and easy to construct.

cured from almost any shop store-room. In addition to the axle assembly, a steel base plate, 1 in. thick x 34 in. in diameter; a steel table top 1/2 in. thick by 36 in. in diameter; a coil spring of 1/8 in. wire, 10 in. long; and a steel yoke plate, 3/4



x 12 x 16 in., are all that is necessary. Material costs on the experimental machine built by Johnson & Jennings Co. ran to \$17.73 and labor costs were \$14.40 (16 hr. at 90c. per hr.), making the total cost of the table \$32.13.

Rectifiers for Electroplating

—Continuing last week's description of the fundamentals of rectifiers and their advantages over the use of motor-generators, the author herein deals with the various types and makes of rectifiers now available.

By ADOLPH BREGMAN
Consulting Engineer, New York

THREE types of rectifiers are being made for use in electroplating: the selenium, the copper oxide, and the magnesium-copper sulphide type.

Copper-Oxide Rectifier

Copper-oxide rectifiers are made in two forms: (a) the circular washer or disk type; (b) the rectangular or plate type. Disk type rectifier units or stacks consisting of a number of copper oxide washers, lead washers, spacers and cooling fins assembled on a bolt under pressure, have been used for some years. The economical limit for this type of unit is about 2 kw. and they are seldom used for ratings above 50 amp. However, small rectifiers of this class are in the hands of thousands of users.

The copper-oxide rectifier for electroplating, as manufactured to-

day, is of the plate (not the disk) type. The rectifier unit consists of a copper plate with a cuprous oxide coat. It is at the contact between the copper and the copper oxide that the rectification takes place. Contact for one polarity is made to the pure copper and for the other polarity, to the copper oxide coating, by means of a metal coating and spring connectors.

The plates are cut from copper strips, oxidized on both sides in a furnace operation and the black cupric oxide surface later reduced to cuprous or red copper oxide. The contact to the oxide coat is made by plates having electroplated nickel contacts. Consequently, both sides are actively engaged in rectification. In one type spring clips along the edges of the plates serve to conduct the current to the oxide film and contact is made to the cop-

per by removing a small area of the oxide at one end of the plate. In another type, the connection is made at the center of the plates and brought to the D.C. circuit through fused links run from the center to the edge of the plates, and all connected in series or parallel as required.

These plates are then assembled on rods and the assembled unit set in a tray, the connections being made in series and parallel to give the desired unit rating. Any number of units can be assembled into a complete rectifier to give the required full rating.

The use of electroplated contacts (instead of sprayed metal, now no longer used) makes it possible to obtain a much firmer or tighter joint between the copper oxide film and the external circuit. Also, plates with electroplated contacts have much greater resistance to moisture and atmospheric conditions. All plates are given three separate varnish treatments to protect them from corrosion.

The operating characteristics of the plate type copper-oxide rectifier may be seen graphically from the charts in Figs. 3 to 8. On the score

of overall efficiency, it should be noted that when new, the copper oxide rectifier may have an efficiency between 75 and 80 per cent. This gradually declines until by the end of about 7000 hr. of service, its efficiency is reduced to between 70 and 75 per cent, where it remains indefinitely; Fig. 4 shows graphically the effect of ageing. In the small sizes, the rectifier efficiency is considerably higher than that of the motor-generator set, but in the medium or large sizes, these two types of equipment are about equal. For the very large units, the motor-generator set leads, slightly.

It is at voltages below their rating and at loads below capacity that copper-oxide rectifiers have an advantage over motor-generator sets.

An interesting example of the improvement in plant operation effected by a rectifier was shown in a copper-oxide plate type rectifier installed by the Hanson-Van Winkle-Munning Co., in the electrotyping plant of the Shane-Beever Co., Baltimore, Md., at a considerable saving of power costs. These advantages, as summarized by the user, were as follows:

(a) The company was formerly using D.C. under which their current-generating equipment was operating less efficiently than the rectifiers on A.C.

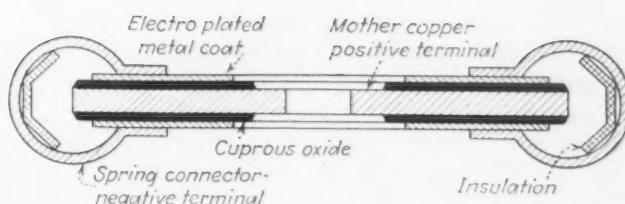
(b) The efficiency of the rectifier, while approximately the same as that of the motor-generator set on full or normal loads, is higher at light loads. In an electrotyping plant, the load fluctuates and sometimes current-generating equipment runs with no load, waiting for work in process to reach the tanks. At such times sharp savings are possible.

(c) If the current-generating equipment must be shut down, the rectifier equipment is easily stopped and started, as there is no starting inertia to overcome and there is no heavy current inrush on starting, as with the motor-generator set.

The General Electric Co. manufactures a copper-oxide rectifier for electroplating service, which differs from the others in that it is made in a few standard designs and sizes. These designs are based on the principle that it has been found more economical to select separate rectifier units of the correct size for each individual tank, in order to maintain approximately full load efficiency, because the rectifiers can be shut down for any

FIG. 9—Typical plate cross-section, copper oxide rectifier.

(Courtesy, Hanson-Van Winkle-Munning Co.)



tanks which are not being used. In addition, each rectifier can be adjusted to the voltage required for its particular tank, thus eliminating the use of a tank rheostat with its inherent losses. Furthermore, by manufacturing a limited number of units in large quantities, production economies are effected.

The two outstanding sizes produced are the 300 amp. and 500 amp., 6 volt outfit, suitable for either 230 or 440, 3-phase, 60-cycle A.C. input. These units can also be furnished for 150 or 250 amp. at 12 volts. Any number of these units can be connected in series, parallel or series-parallel to obtain any required D.C. output.

The complete installation is built up from standard sectional units, each of which has an output capacity of 1.8 kw., or 3 kw. By paralleling two or more sections, any desired current capacity can be obtained, and where two or more rectifier sections are paralleled, simu-

taneous control of all sections is obtainable with one voltage regulator.

The hand-operated voltage regulator is so designed that it can be installed at a point far from the rectifier units and near the plating tank or any other place convenient to the operator. The regulator has 36 steps between 1 volt and the maximum, but can be furnished with up to 100 steps if desired. It also provides control for starting and stopping the rectifier, making it possible for the operator to have full control at the tank by means of an accurate ammeter and voltmeter to give tank conditions.

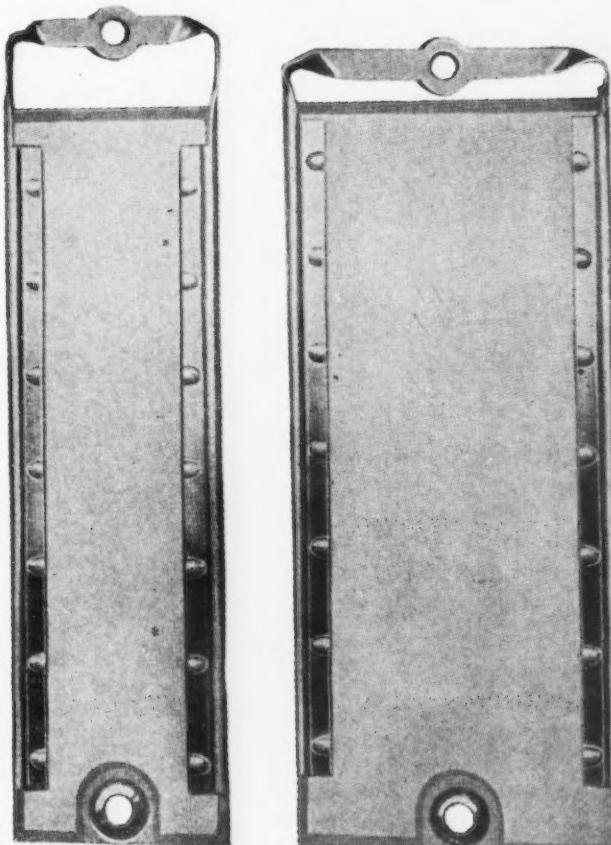
These regulators are furnished with "on-load" control which permits full adjustment of the output without interrupting the plating circuit.

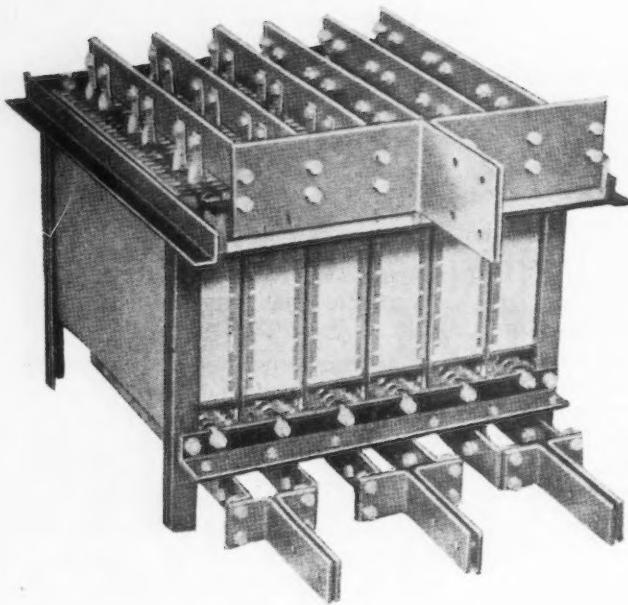
Selenium Rectifier

The rectifying element of the selenium rectifier consists of a mix-

FIG. 10—Typical rectifier plates used in copper oxide plate-type rectifiers.

(Courtesy, Hanson-Van Winkle-Munning Co.)





LEFT

FIG. 11—Typical plate assemblies, showing six parallel plates having a continuous output of 3 kw. and ready for installation in cabinet.

(Courtesy, Hanson-Van Winkle-Munning Co.)

• • •

BETWEEN

FIG. 12—Wiring diagram for copper oxide rectifier; 230 volt power line.

(Courtesy, Hanson-Van Winkle-Munning Co.)

ture of pure selenium with a small percentage of special alloying elements, coated on a nickel-plated, sand-blasted, steel disk. The disk is given a special heat treatment; then a low resistance contact alloy is sprayed, in molten form, on the selenium surface.

Using the back of the steel disk as one contact and the sprayed alloy as the other, any required number of disks are assembled

with contact washers, connecting lugs, etc., on an insulated stud to build up a "stack" with the desired voltage and ampere ratings. The complete stack receives two coats of a baked enamel to protect it from corrosive atmospheres.

The selenium rectifier is small and light thereby saving floor space and floor loads. It is mounted on casters for mobility. As made today by the W. Green Electric Co., it

embodies certain original features and it is custom-built to incorporate any special features desired. It is made in unit construction or remote control construction as desired. It uses a convenient layout: twin output terminals for right and left hand operation and for connection with additional selenium rectifiers.

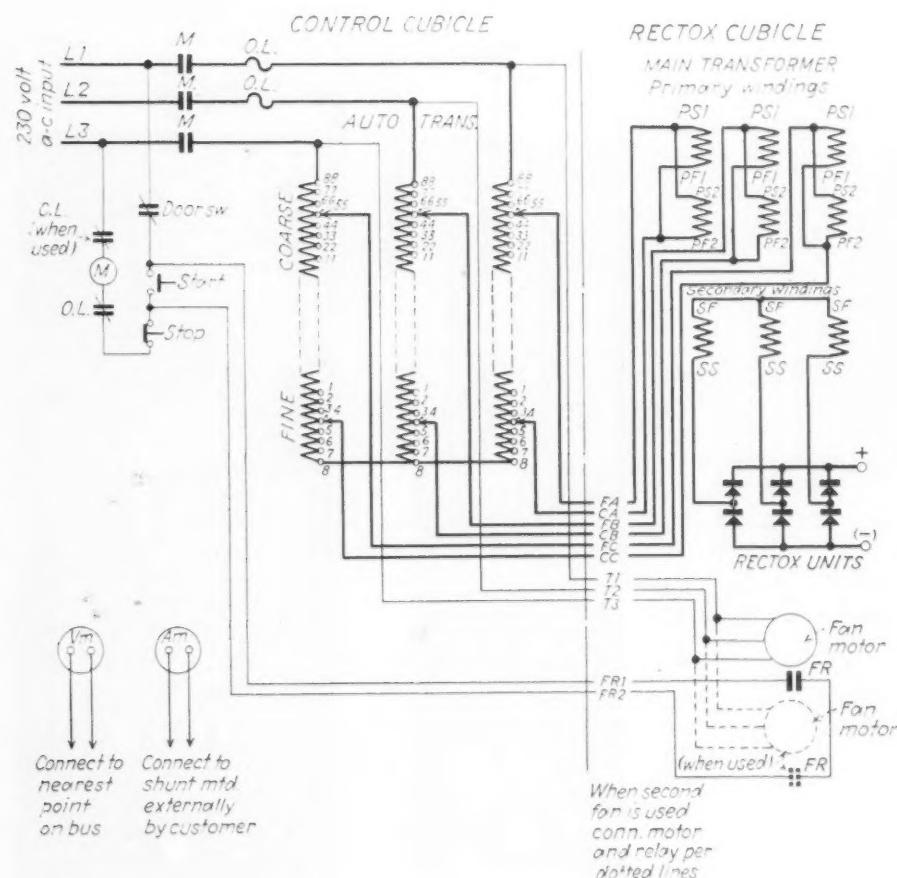
This rectifier is available in a wide range of capacities, for example from 4.4 to 3000 amp. at 6 volts. Other units are available for 12, 18, 24, 36, 48 and higher voltages for electro-polishing, anodizing and experimental work. These equipments are characterized by the incorporation of special custom-built features.

Recently a practical test was made of a selenium rectifier in the plant of Brust Bros., of Brooklyn, N. Y. The rectifier was hooked up to a chromium plating tank and various types of work plated at voltages from 1 to 6. The results of the test showed that chromium plating could be done without difficulty under practical operating conditions using a rectifier as a source of current instead of a motor-generator set. The chromium deposited was bright and the throwing power was fully up to the normal standard.

Magnesium-Copper Sulphide Rectifier

The magnesium-copper sulphide rectifier was developed and patented more than 15 years ago by Samuel Ruben. A disk of copper sulphide is squeezed tightly against a disk of magnesium, and the rectification takes place at the junction of the two disks. It has the ability to rectify the large volumes of current required for electroplating with a minimum amount of material and parts. A rectifying junction of $1\frac{3}{4}$ sq. in. area is sufficient to rectify 100 amp. D.C. when connected in a full wave, 3-phase circuit; that is, a current density of 57 amp. D.C. per sq. in. of active rectifying surface.

Copper sulphide-magnesium rectifiers contain electro-thermally processed integral junctions of cupric sulphide and magnesium. They are of the contact or the barrier layer type. The cupric sulphide is in the form of a solid, thick disk, and is in intimate contact with a heavy disk of magnesium. This thick disk of cupric sulphide acts as a reservoir to maintain rectification properties and to repair any damage which occur due to



abnormal voltage surges. This self-healing characteristic provides an important safety factor, although according to the Standard Handbook for Electrical Engineers (1933 Edition p. 1018) "the units deteriorate if left idle in a moist atmosphere."

In the design made by P. R. Mallory & Co., and distributed by the Udylite Co., the magnesium-copper sulphide rectifier consists of multiple stacks of rectifying elements assembled on common radiator and terminal plates. The plates give internal connection of all junctions resulting in even load distribution and uniform temperature. The shape of the plates and arrangement of the rectifying elements is varied to suit the individual requirements of each type of unit. Custom built plates are available in any desired voltage and current ratio with control equipment to suit the individual requirements. In addition, a standardized low-cost unit rated at 1440 amp. 6 volts, or 720 amp. 12 volts, is available through the Udylite Co. This has been designed for maximum economy and compactness to handle numerous standard plating tanks and barrels as individual units. While an entire plant may be powered by units of this type they are particularly advantageous in increasing the capacity of over-crowded or overloaded departments.

Both materials and structure are stable over a wide range of temperatures, and their operation is uniform from minus 40 deg. F. to above 300 deg. F. The efficiency and output are unaffected by temperature variations within this range.

Due to the high allowable current densities of this type of rectifier the active elements are considerably smaller than those of other types.

The magnesium-copper sulphide rectifier has no tendency to decrease in output during the life of the unit.

The rectifier is mounted directly over the transformer and the cooling air is first drawn under and over the transformer and through the rectifier to reduce the size, weight and cost of the transformer.

Without changing the output voltage adjustments, the D.C. voltage at full load is approximately 85 per cent of the D.C. voltage at no load. The efficiency remains practically constant at 50 to 55 per cent over the useful operating range and in any size. These rectifiers are

FIG. 13—Layout of copper oxide rectifier, voltage regulator and plating tank. Connection diagram showing installation of 2000 amp., 6 volt unit.

(Courtesy, General Electric Co.)

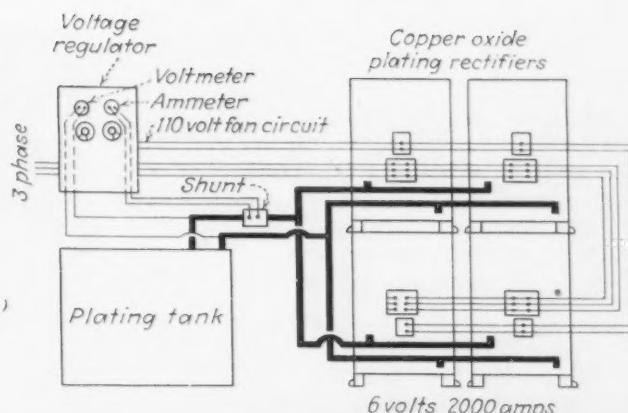


FIG. 14—Copper oxide plate-type rectifiers located in convenient out-of-the-way position in a well known electrotyping plant. Here, because of space limitations, two smaller units were placed adjacent and hooked together to give 3000 amp., 6 volt capacity. They replace two 1500 amp. motor-generator sets with D.C. motors.

(Courtesy, Hanson-Van Winkle-Munning Co.)

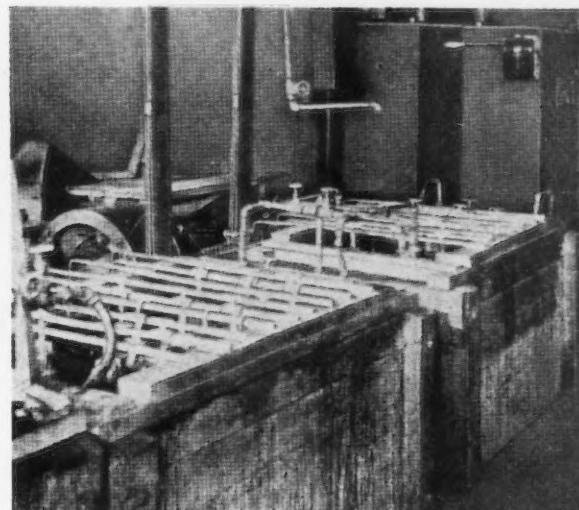
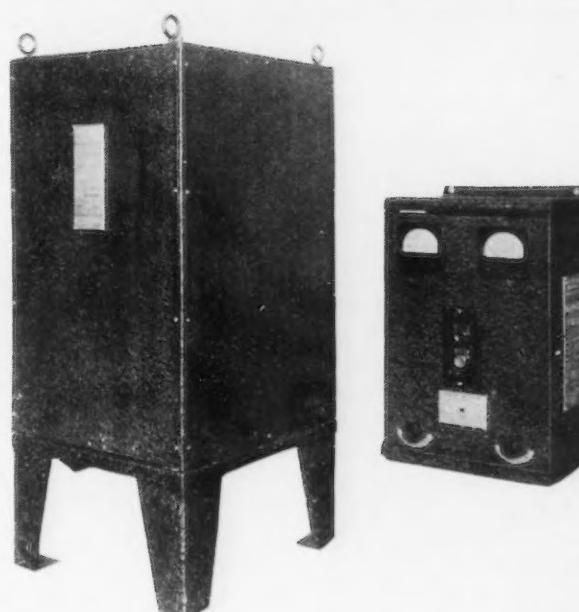


FIG. 15—Power cubicle and control cubicle, 300 amp., 6 volt, for copper oxide rectifier.

(Courtesy, Hanson-Van Winkle-Munning Co.)



available in multiples of 100 amp. and in voltage steps of $2\frac{1}{2}$ volts.

An instance is cited of a 3000-amp. $7\frac{1}{2}$ volt rectifier of this type installed in a large electrotyping plant. After seven months of operation, the operators of the plant found that a slight increase in power cost was more than offset by the complete absence of maintenance costs, and by the fact that the rectifier could be used immediately after being turned on, thus eliminating the 30 min. to 1 hr. required for a motor-generator set to reach stable operating conditions. This plant to date has given more than 30 months of satisfactory service and is still running.

A report from an experienced

user of magnesium-copper sulphide rectifiers for plating, presents a clear picture.⁶

Rectifiers may be used for plating operations in three set-ups: (1) The rectifier as itself. (2) The rectifier provided with the usual type of tank rheostat. (3) The rectifier provided with voltage regulators.

The rectifier as itself is very satisfactory for any processes where a constant load can be maintained. In the case of anodizing it is possible by choosing a definite voltage (hooking up the rectifiers in series or parallel to obtain the desired pressure) to obtain a wide range of operating load, running from 100 to 700 amp., without burning. In other words, for this particular process a directly connected rectifier without any controls other than the starting and stopping switches has been found satisfactory for a wide range of work.

Rectifiers for processes which require closer control can be used with ordinary tank rheostat regulation. (Of course, this type of regulation has the disadvantage of dissipating electric current in the form of heat and losing power which is paid for.)

For the ordinary run of industrial hard chromium plating for ex-

⁶ Bibliography will be published next week.

THE machine pictured, which is about 208 ft. long, is for rifling big naval guns up to 20 in. bore and 82 ft. long. The preliminary set-up to rifling the gun is to set the "former ribbon," seen at the right, to the desired helix angle. Then as the rifling bar is moved forward, it is rotated by a rack moved by the forming bar and meshing with a gear on the bar. A planer type tool on the front bar support is used to cut a groove in the bar which is used as a guide to turn the bar when actually rifling the gun. Several grooves are cut simultaneously in a manner similar to the operation of a planer except that the tools move and the work remains stationary. Very light cuts, from 0.001 to 0.0015 in., are taken. When a set of grooves is completed, the rifling bar is indexed and additional grooves cut. This process is repeated until the gun has been completely rifled. Rifling speed is adjusted between 9 and 54 ft. per min.

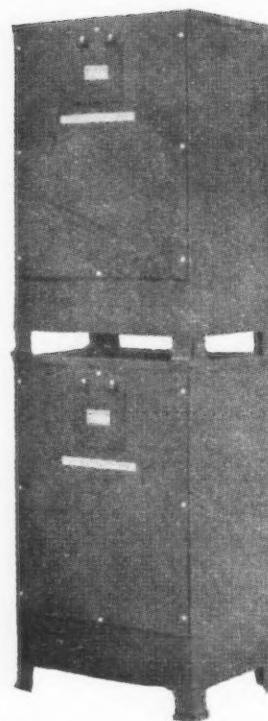


FIG. 16—Tier mounting two 500 amp. rectifiers, giving a 1000 amp., 6 volt rectifier on floor space 24 1/2 x 20 in.

(Courtesy, General Electric Co.)

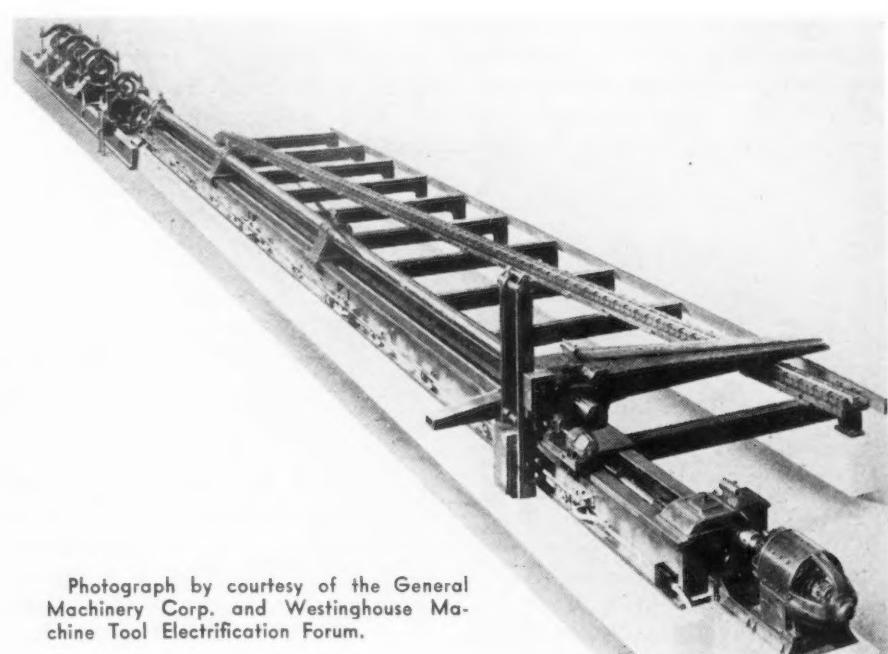
ample, where medium and large parts are handled, the total current is substantial in volume and the regulation obtained by means of a voltage regulator should be satisfactory.

In the exceptional cases where extremely close control is desired, generator voltage control by means of a field rheostat has been found better than this rectifier. Such work includes industrial hard chromium plating where the work handled is very small, delicate and complex. In these special cases where the total current load per unit is small, regulation of the finest character is necessary. Only field control from a standard motor-generator set can take care of such cases.

Some tests were recently conducted using two anodizing tanks, one connected with the motor-generator set and the other with magnesium-copper sulphide rectifiers processing the same type of work in both units. Voltage and ampere characteristics at the tank were found identical in both cases, showing no appreciable difference in voltage drop, original current surge, etc.

This type of rectifier is lower in cost than the others of equivalent capacity.

Ed. Note: Next week the author concludes with a description of the comparative performance of rectifiers and motor-generator sets.



Photograph by courtesy of the General Machinery Corp. and Westinghouse Machine Tool Electrification Forum.

Iron and Steel Engineers Prepare Cleveland Exposition

FOR months the steel industry has maintained near capacity operations without the slightest sacrifice in the quality of products produced despite more than the normal run of difficulties. With monotonous regularity, new plant records have been made that a year or two ago would have been thought to be either impossible of attainment or else could be made only at great sacrifice to equipment.

Engineers attending the Association of Iron and Steel Engineers' annual convention and exhibit, Sept. 23 to 26, at the Cleveland Public Auditorium, in Cleveland,

however, will find that the best is not enough and even more seemingly impossible feats will have to be performed as long as the present emergency lasts. Recognizing this trend, the association has made provision for technical sessions which will shed much light on current problems and should present valuable data to enable the engineer and production man to continue the same type of performance as he has since the emergency began.

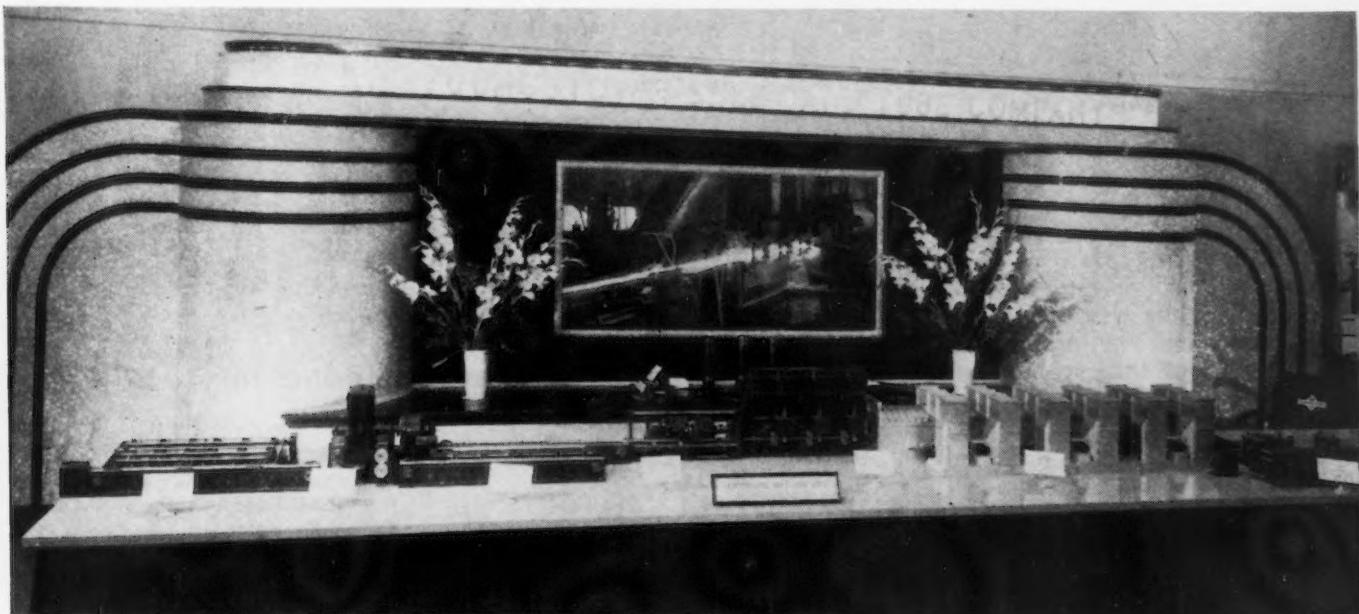
In the midst of all the talk about expansion and shortages, perhaps not enough light has been shed on what the iron and steel industry

has been able to do WITH WHAT IT HAS.

It is probably not common knowledge that many blast furnaces rated at about 600 tons daily have consistently produced 800 and even 900 tons a day. These records have been made despite the necessity for using beehive coke which has forced engineers and production officials to keep constant watch over operations because of the lack of uniformity in various lots of such coke, as contrasted with controlled production using by-product coke.

While normal practice has indi-

SCALE miniature of Youngstown Sheet & Tube Co.'s continuous butt-weld (Fretz-Moon) pipe mills at Youngstown, and Indiana Harbor, Ind. These units, completed by Salem Engineering Co. in 1939 and 1940, continuously butt-weld pipe $\frac{1}{2}$ to 3 in. in diameter. (Details and data on other continuous butt-weld pipe mills. THE IRON AGE, March 28, 1940.)



cated that open hearth furnace repairs would require shutdowns approximating 12½ per cent of total potential capacity, many steel plants have taken open hearths off and completely repaired and renovated them in far less time than was considered a speedy operation a few years ago. Numerous steel companies have for weeks and even months on end operated at 100 per cent of capacity or more by performing the seemingly impossible.

Modern high speed strip mills which were glowingly rated at, say, 60,000 tons a month, have produced as high as 85,000 tons and in one case as high as 93,000 tons of material in one month. These experiences have not been isolated cases and some have been consistent records which have only been the result of the closest cooperation between engineering, production, metallurgical, and order departments.

A few years ago it was considered to be unique to obtain a speed of 2100 or 2300 ft. a min. off tandem cold reduction mills, yet one company today thinks nothing of reporting speeds running as high as 3800 ft. a min. As a matter of pure fact, much finishing mill equipment today has no known capacity figure since each month produces a record which makes the original estimate look small by comparison.

Those in the steel industry, however, who have a grasp of what the national defense program means now and will ultimately mean, warn against undue optimism over current performance since they know demands made upon the engineer and the production man in the coming months of the national emergency will demand the use of every conceivable short cut to greater production without sacrifice of quality.

The tremendous expansion program being talked up today involves problems not only connected with actual pig iron and steel production but reach back to ore supplies, shipping facilities, railroad cars, storage space, ore bridges, coal facilities, coke plants, new techniques, heating furnaces, semi-finished capacity, and many other important factors which will show themselves soon enough.

With many of these ideas in mind, association speakers will cover such topics as ore bridges, design and operation of the Bessemer converter, recent advances in control of multi-fuel fired furnaces,



WILLIAM A. PERRY, president, Association of Iron and Steel Engineers and superintendent, Electrical and Power Departments, Inland Steel Co., Indiana Harbor, Ind.

effect of rate of operation in coke plant, modern sintering plant design and construction, and many other topics now ranking high on the agenda of iron and steel engineers.

The official program of the convention and exposition is as follows:

Tuesday, Sept. 23

- 9:00 A.M.—Registration—Main Lobby.
9:15 A.M.—Business Session—Club Room B.
9:30 A.M.—Electrical Engineering Division—Club Room B.

"Report of Crane Specification Committee," by F. W. Cramer, Electrical Engineer, Carnegie-Illinois Steel Corp., Pittsburgh.

"Ore Bridges," by George Wolfe, Special Engineer, Dravo Corp., Pittsburgh.

"Transmitting Torque from Electric Motors," by A. M. MacCutcheon, Vice-President in Charge of Engineering, Reliance Electric & Engineering Co., Cleveland.

1:30 P.M.—Mechanical Engineering Division—Club Room B.

"Design and Operation of the Besse-

mer Converter," by D. R. Loughrey, Assistant General Superintendent, Jones & Laughlin Steel Corp., Pittsburgh.

"Rolling Pressures in the Strip Mill," by M. R. Stone and J. I. Greenberger, United Engineering & Foundry Co., Pittsburgh.



THOMAS E. HUGHES, 1st vice-president, Association of Iron and Steel Engineers, and superintendent of maintenance, Carnegie-Illinois Steel Corp., Duquesne, Pa.

1:30 P.M.—Welding Engineering Division—Club Room A.

- "Advanced Methods of Welding," by E. W. P. Smith, Consulting Engineer, Lincoln Electric Co., Cleveland.
"Classification of Modern Welding Equipment," by C. H. Jennings, Research Department, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
"Welding in Cold Strip Processing," by J. H. Cooper, Welding Engineer, Taylor Winfield Co., Warren, Ohio.

10:00 P.M.—Exhibitors' Dance—Grand Ball Room, Hotel Statler—Informal.

Wednesday, Sept. 24

9:00 A.M.—Combustion Engineering Division—Club Room B.

"Recent Advances in Control of Multi-Fuel Fired Furnaces," by J. C. Vaaler, Askania Regulator Co., Chicago.

"Modern Designs of Annealing Covers," by Lee Wilson, President, Lee Wilson Engineering Co., Cleveland.

"Submerged Heating for Pickling Baths," by W. G. See, The Submerged Combustion Co. of America, Inc., Hammond, Ind.

9:00 A.M.—Operating Practice Division—Club Room A.

"Effect of Rate of Operation in the Coke Plant," by B. J. C. van der Hoeven, General Superintendent, Koppers Co., Pittsburgh.

"Modern Sintering Plant Design and Construction," by M. F. Morgan, Engineer, Republic Steel Corp., Cleveland.

"Control of the World's Reserves of Steel Making Materials," by Charles Hart, Charles Hart & Associates, Chester, Pa.



FRANK E. FLYNN, 2nd vice-president, Association of Iron and Steel Engineers and district manager, Republic Steel Corp., Warren, Ohio.

1:30 P.M.—Inspection Trip; Otis Steel Co., Cleveland. Buses will leave Cleveland Public Auditorium.

7:30 P.M.—Formal Banquet and Dance—Grand Ball Room, Hotel Statler.

Speakers: E. J. Kulas, President, Otis Steel Co.; and James R. Young, Journalist.

Thursday, Sept. 25

9:00 A.M.—Electrical Engineering Division—Club Room B.

"Report on Field Tests on IR Drop Compensation," by G. E. Stoltz, Manager, Metal Working Engineering, Industry

Engineering Department, Westinghouse Electric & Mfg. Co., East Pittsburgh.

"The Temper Mill," by T. B. Montgomery, Control Engineer, Allis-Chalmers Mfg. Co., Milwaukee.

"Motor Applications and Power Requirements for Strip Processing Lines," by H. W. Poole, Steel Mill Section, Industrial Engineering Department, General Electric Co., Schenectady, N. Y.

9:00 A.M.—Combustion Engineering Division—Club Room A.

"Modernization of Heating Furnace Design," by M. H. Mawhinney, Consulting Engineer, Salem, Ohio.

"Fuel Applications in Metallurgical Furnaces," by F. W. Bloom, President, Bloom Engineering Co., Pittsburgh.

"Organization of Fuel Department Personnel and Practice," by T. J. McLaughlin, Assistant to Vice-President of Opera-

ment Manager, Linde-Air Products Co., New York.

1:30 P.M.—Lubrication Engineering Division—Club Room A.

"Diesel Engine Lubrication," by D. N. Evans, Lubrication Engineer, Inland Steel Co., East Chicago, Ind.

"Sealing Methods for Oil Film Bearings," Symposium led by L. F. Coffin, Superintendent, Mechanical Department, Bethlehem Steel Co., Sparrows Point, Md.

"Filtration and Reclamation of Oils," by C. A. Bailey, Assistant to Superintendent, Plant Maintenance, Sheet and Tin Mill Division, Carnegie-Illinois Steel Corp., Gary, Ind.

1941

Exhibitors at the

IRON AND STEEL EXPOSITION

Company	Booth No.
Air Reduction Sales Co.	123-124-124A
New York, N. Y.	
Alemite Division, Stewart Warner Corp.	101
Chicago, Ill.	
Alliance Machine Co.	147
Alliance, Ohio	
Allis-Chalmers Mfg. Co.	38-39-40-41
Milwaukee, Wis.	
Aluminum Company of America	81-82
Pittsburgh, Pa.	
American Air Filter Co., Inc.	98-99
Louisville, Ky.	
American Car & Foundry Co.	11-12
New York, N. Y.	
Amsler-Morton Co.	22-23
Pittsburgh, Pa.	



C. L. MCGRANAHAN, treasurer, Association of Iron and Steel Engineers and assistant general superintendent, Jones & Laughlin Steel Corp., Pittsburgh.

tions, Carnegie-Illinois Steel Corp., Pittsburgh.

1:30 P.M.—Operating Practice Division—Club Room B.

"Procedure in Scarfing High Carbon and Alloy Steels," by G. D. Winlock, Steel Mill Engineer, Air Reduction Sales Co., New York.

"Electrolytic Tinplate," by M. R. Stone, United Engineering & Foundry Co., Pittsburgh.

"Oxy-Acetylene Defense Developments," by J. H. Zimmerman, Develop-



J. L. MILLER, secretary, Association of Iron and Steel Engineers and assistant chief combustion engineer, Republic Steel Corp., Cleveland.

Askania Regulator Co.	64-65
Chicago, Ill.	
Automatic Transportation Co.	28-29-30-31-32
Chicago, Ill.	
Baker-Raulang Co.	134-135-136
Cleveland, Ohio	*

Barrett-Cravens Co.	5
Chicago, Ill.	
Bartlett Hayward Div., Koppers Co.	119
Pittsburgh, Pa.	
Benjamin Electric Mfg. Co.	102-103
Des Plaines, Ill.	
Blaw-Knox Co.	66-67
Pittsburgh, Pa.	
A. W. Cadman Mfg. Co.	115
Pittsburgh, Pa.	
Carbone Corporation	17
Boonton, N. J.	
Clark Controller Co.	19-19A-20-20A
Cleveland, Ohio	
Cleveland Crane & Engr. Co.	127
Wickliffe, Ohio	
Colt's Patent Fire Arms Mfg. Co.	15
Hartford, Conn.	
Crouse-Hinds Co.	18
Syracuse, N. Y.	
Cuno Engineering Corp.	125-126
Meriden, Conn.	
Cutler-Hammer, Inc.	46-47-58-59
Milwaukee, Wis.	
Joseph Dixon Crucible Co.	110
Jersey City, N. J.	
Thomas A. Edison, Inc.	9
Orange, N. J.	
Electric Controller & Mfg. Co.,	
Cleveland, Ohio	138-139-140-141
Electric Storage Battery Co.	117
Philadelphia, Pa.	
Elwell-Parker Electric Co.	148-149
Chicago, Ill.	
Eutectic Welding Alloys	146
New York, N. Y.	
Farval Corporation	143-144-145
Cleveland, Ohio	
Fulton Fdry. & Machine Co., Inc.	108
Cleveland, Ohio	
Garlock Packing Co.	14
Palmyra, N. Y.	
General Electric Co.	68-69-70-71-72-73
Schenectady, N. Y.	
Graybar Electric Co., Inc.	80
New York, N. Y.	
Hagan Corp.	104-105
Pittsburgh, Pa.	
Holophane Co., Inv.	111
New York, N. Y.	
Homestead Valve Mfg. Co.	8
Coraopolis, Pa.	
Hyatt Bearings Division, General	
Motors Sales Corp.	24-25
Harrison, N. J.	
I-T-E Circuit Breaker Co.	60-61
Philadelphia, Pa.	
Jefferson Electric Co.	21
Bellwood, Ill.	
Johns-Manville	96-97
New York, N. Y.	
Keystone Lubricating Co.	1
Philadelphia, Pa.	
Linde Air Products Co., Union	
Carbide Co.	94-95
New York, N. Y.	
Link-Belt Co.	43
Chicago, Ill.	
Mercury Mfg. Co.	118
Chicago, Ill.	
Mesta Machine Co.	26-27
Pittsburgh, Pa.	
Miller Co.	131-132
Meriden, Conn.	
Morgan Construction Co.	112
Worcester, Mass.	
Morgan Engineering Co.	76-77
Alliance, Ohio	
Morganite Brush Co., Inc.	57
Long Island City, N. Y.	
National Carbon Co., Inc.	44-45
Cleveland, Ohio	
National Electric Coil Co.	55-56
Columbus, Ohio	
National Electric Products Corp.	49
Pittsburgh, Pa.	
Ohio Carbon Co.	50
Cleveland, Ohio	
Otis Elevator Co.	116
New York, N. Y.	
Pennsylvania Electric Coil Corp.	130
Pittsburgh, Pa.	
Philco Corp.	133
Philadelphia, Pa.	
Pittsburgh Pipe Cleaner Co.	120
Pittsburgh, Pa.	
Post-Glover Electric Co.	83
Cincinnati, Ohio	
Ready-Power Co.	137
Detroit, Mich.	
Reliance Electric & Engineering Co.	
Cleveland, Ohio	
51-52-53-54	
Rockbestos Products Corp.	48
New Haven, Conn.	
Rollway Bearing Co., Inc.	6-7
Syracuse, N. Y.	
Salem Engineering Co.	128
Salem, Ohio	
SKF Industries, Inc.	90-91
Philadelphia, Pa.	
Socony-Vacuum Oil Co., Inc.	84-85
New York, N. Y.	
Speer Carbon Co.	4
St. Mary's, Pa.	
Thompson Electric Co.	114
Cleveland, Ohio	
Tide Water Associated Oil Co.	121-122
New York, N. Y.	
Tool Steel Gear & Pinion Co.	74-75
Cincinnati, Ohio	
Towmotor Co.	92-93
Cleveland, Ohio	
Trabon Engineering Corp.	78
Cleveland, Ohio	
Trumbull Electric Mfg. Co.	100
Plainville, Conn.	
United Engr. & Fdry. Co.	2-3
Pittsburgh, Pa.	
Wagner Electric Corp.	62-63
Pittsburgh, Pa.	
John Waldron Corp.	142
New Brunswick, N. J.	
Wellman Engineering Co.	42
Cleveland, Ohio	
Westinghouse Elec. & Mfg. Co.	
East Pittsburgh, Pa.	
32-33-34-35-36-37-106-107	
Edwin L. Wiegand Co.	10
Pittsburgh, Pa.	
Yale & Towne Mfg. Co.	86-87-88-89
Philadelphia, Pa.	
York Ice Machinery Corp.	79
York, Pa.	

Boiler Seams to Be Examined with Million Volt X-ray Machine

ONE of the first million volt X-ray units ever built for industrial use, generating energy equal to \$90,000,000 worth of radium, is being installed in the Chattanooga boiler shops of the Combustion Engineering Co., Inc., New York, for radiographic study and examination of welded seams in boiler drums and other high pressure vessels. Drum walls for modern high pressure vessels, ranging in thickness from 3 to 5 in., can be radiographed quickly with this unit, the 5-in. plate requiring about 5 min., at a focal distance of 48 in., and the 3-in. plate can be penetrated in 48 sec., at the same focal distance.

With the 400,000-volt unit, the largest previous industrial installation, the most practical focal distance for these thicknesses is 32 in., and at this distance the exposure time is considerably longer, taking 135 min., for the 5-in. plate and 2½ min., for the 3-in. plate. In addition to the time saved in making each exposure, the longer focal length of the new equipment reduces the number of exposures necessary for a given area. The negatives from the new equipment will be of superior quality, it is claimed, providing sharp diagnostic details even at maximum penetrations, which are estimated to be as

great as 8 in., in good commercial time.

The new X-ray equipment is being housed in an especially constructed building with 18-in. concrete walls to provide adequate protection against the escape of stray X-rays, and the operator's room is separated from the main building by full wall thickness. Rated at 1,000,000 volts and 3 milliamp. continuous current, the unit consists of a resonant transformer in which is a coaxially-mounted, multisection, high vacuum X-ray tube, both contained in a grounded steel tank insulated with compressed Freon gas.

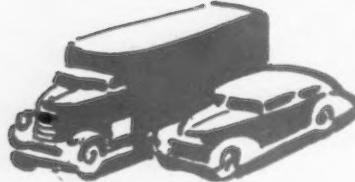
(Advertisement)



PUTTING MORE BRAINS IN BRASS. Men make brass. Previously, we have shown you some of the men who put the human touch into copper and copper-base alloys for Revere Copper and Brass Incorporated. Here is an example of the equipment that helps them do it—by freeing their energy for things that call for headwork. This "roller coaster" handles materials with the efficiency of a well-run railroad. Because it lets skilled men use brains instead of brawn, it helps to put more brains behind the metals you get from Revere. This machinery, built in 1938, is indicative of the foresight which enables Revere today to meet the ever-growing needs of the national emergency—and which will enable Revere tomorrow to supply more and better materials for the re-birth of American industry. Revere Copper and Brass Incorporated, 230 Park Avenue, New York.

Assembly Line . . .

• General Motors soon to build tanks . . . Ford testing high horsepower pancake type of aircraft engine . . . Briggs reaches mass production of aircraft parts.



DETROIT—A series of revelations of new defense products to be made in the Detroit area came to light during the past week. Among these is acknowledgement of the fact that General Motors will shortly begin the production of tanks (that it has diesel tank engines in development and also in production; that Ford Motor Co. is already testing a high horsepower pancake type of engine for aircraft and a tank engine, and that an auto body concern probably will participate as a sub-contractor in the near future for the machining and fabrication of tank parts.

News of these prospective defense activities came during a week in which actual defense production was displayed on a spectacular scale to the press of the nation.

The week was officially preview week for the majority of the new 1942 model automobiles but in an even more important sense it was preview week for a multitude of defense projects that are becoming reality in Detroit and vicinity.

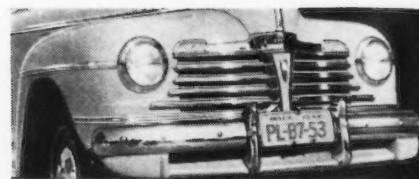
BRIGGS MANUFACTURING CO. was the first to show its wares, so to speak, when it opened its new aviation parts plant for inspection. On a 20-acre tract of

ground that had on it circus tents of Barnum & Bailey a year ago, Briggs now has a new plant in mass production on \$40,000,000 worth of airplane sub-assemblies. It is very definitely the first company in the automobile industry to reach the mass production level on aviation parts and it is significant that the contracts are all privately negotiated ones. The development to date represents the efforts of Briggs management, capital and technical brains.

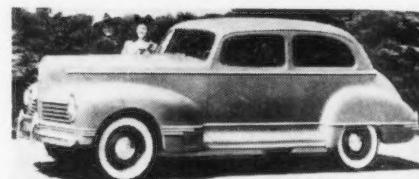
W. P. Brown, president, revealed that the company now has seven such contracts, two with Vought-Sikorsky, two with Douglas, one with Boeing, one with Martin and one with Lockheed-Vega. The company is making wings for the Vought-Sikorsky scout-observation-training plane, Boeing bomb doors for the Flying Fortress, 70 different duct sections for the Flying Fortress and many other miscellaneous airplane parts such as wing flaps and gas tank ends. In addition, it is doing engineering work on the wings for the new Vought-Sikorsky fighter plane and shortly will be in production on Douglas wings.

Technically, the most outstanding contribution Briggs has made is in the adaptation of automotive spot welding technique to the assembly of airplane parts. Brown traced this development back to 1923 when the company undertook the manufacture of Ford coupe bodies in lots of 1,000 a day. It was demonstrated then, he said, that it was impossible to rivet successfully in mass production, so the company set out on a development of a spot welding program. From 1923 to 1930, under the direction of Henry Platz, the company's chief of tool engineering, an outstanding job was done in the development of spot welding equipment. A single welder, operated on two shifts, was able to produce 80,000 welds a day.

Meanwhile, the company had also investigated the use of such welding equipment on aluminum alloy sheets. Today it is the only company in the United States with both Army and Navy approval on virtually every gage of aluminum alloy. On the Sikorsky wing, which by the way was designed



UNDER THIS PLYMOUTH bumper is a scoop which provides the major part of the air for the engine radiator.



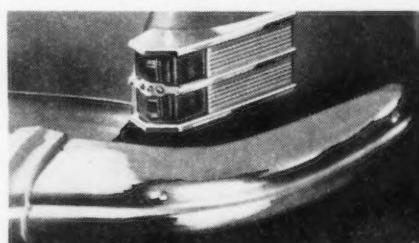
BROAD STRIP of bright metal along the lower body and fenders of the 1942 Hudson Six Deluxe sedan.



RUNNING BOARDS are in favor again on most 1942 cars but are completely concealed as in the Hudson.



LARGEST STAMPING ever incorporated in an auto body structure (except for the top) is in the new Packard.

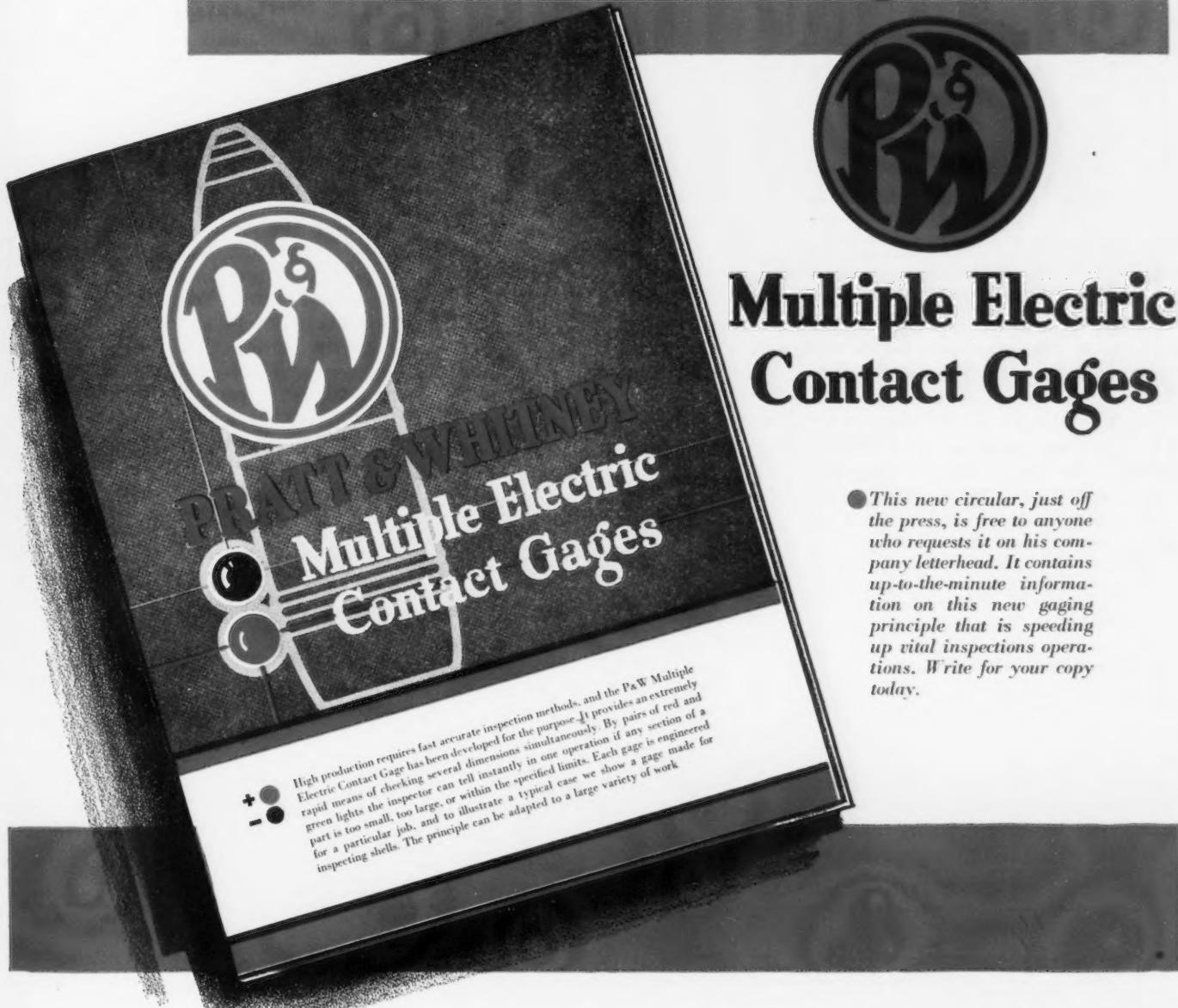


1942 BUMPERS are being curved around the fenders to protect the sheet metal from damage.



TYPICAL of the 1942 design is the low, wide grille on the Studebaker Commander and President.

Developed for fast accurate inspection



Multiple Electric Contact Gages

• This new circular, just off the press, is free to anyone who requests it on his company letterhead. It contains up-to-the-minute information on this new gaging principle that is speeding up vital inspections operations. Write for your copy today.

High production requires fast accurate inspection methods, and the P&W Multiple Electric Contact Gage has been developed for the purpose. It provides an extremely rapid means of checking several dimensions simultaneously. By pairs of red and green lights the inspector can tell instantly in one operation if any section of a part is too small, too large, or within the specified limits. Each gage is engineered for a particular job, and to illustrate a typical case we show a gage made for inspecting shells. The principle can be adapted to a large variety of work

+ The inspection principle of the P&W Multiple Electric Contact Gage can be applied to a great variety of products. Each is engineered for a particular job, but the application is not difficult . . . and it works! Any desired combination of dimensions *all* can be checked *in one operation* on a finished piece. A green light indicates undersize, a red light oversize, and no lights at all show the piece to be within the specified limits. Find out about this fast accurate inspection.

-

P R A T T & W H I T N E Y

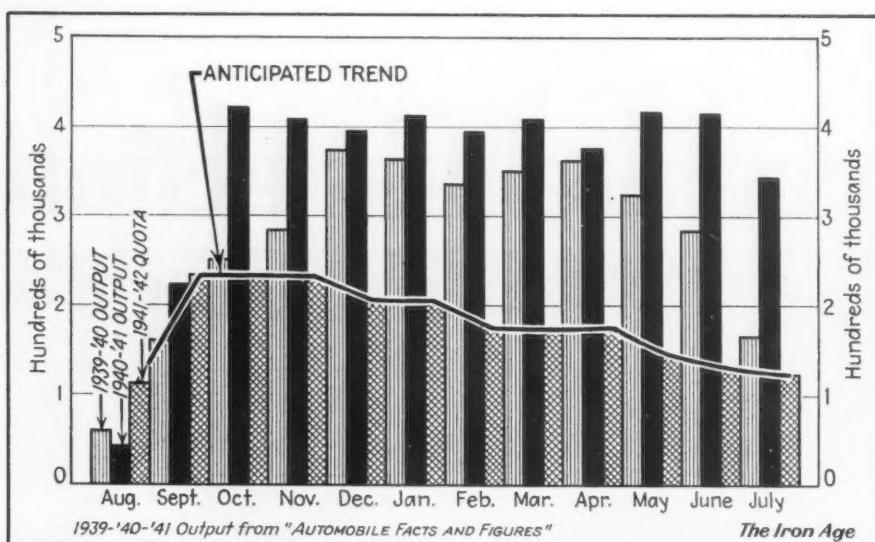
DIVISION NILES-BEMENT-POND CO.

WEST HARTFORD

•

CONNECTICUT

ON THE ASSEMBLY LINE



WHAT WILL HAPPEN to automobile production during the forthcoming year, if Leon Henderson does not change the tentative production schedule as shown in this chart, with a comparison of the monthly output during the previous two model years. As reported in last week's "Assembly Line" the proposed schedule trims output about 50 per cent to a total of 2,246,786 passenger cars for the entire year.

(See monthly quotas in issue of Sept. 11, p. 68.)

for welding, and is also being welded by the Vought-Sikorsky company itself, there are only 2000 rivets in the entire wing, but there are 11,000 spot welds. In other words, this Navy plane wing is nearly 85 per cent spot welded in assembly.

THE speed of welding has been demonstrated to be consistently faster than the speed of riveting. Brown estimated that an operator could drill 30 holes and set 30 rivets in two hours, whereas an operator could do 24 to 30 spot welds per hour, includ-

ing the time necessary to clean and dress points on the machine.

At Briggs it was revealed that this firm will be one of those to suffer severely as a result of the automobile curtailment problem—despite the fact that Briggs has shown much initiative in seeking out defense work to do. Of the firm's 23,000 employees (a peak in July of this year) approximately 11,000 probably will be out of work by the first of the year as a result of automotive curtailment. It is anticipated that about 3000 of these can be absorbed into the airplane parts

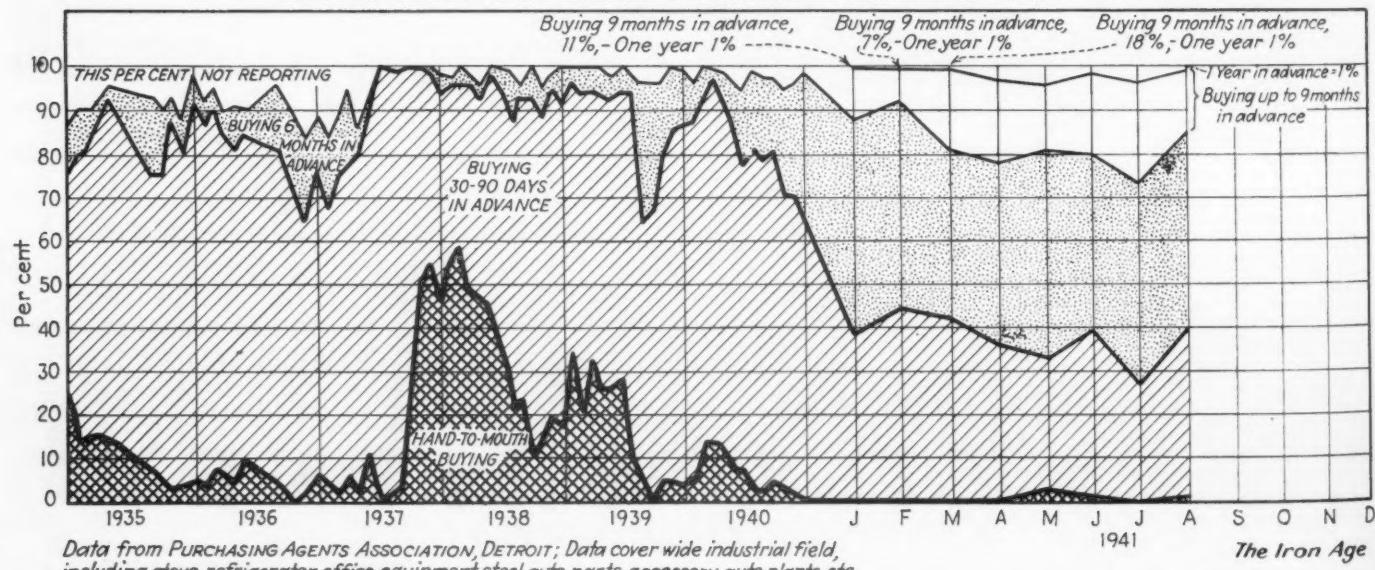
plant, leaving something like 8000 without jobs. At present Briggs is employing 3,200 men on aviation parts, so it is indicated that more than 6000 will be doing aviation work in this plant by the first of the year. The aircraft parts plant is being operated by Henry H. Budds, who was manager of the Briggs plant in England and had personal experience there with the transition of automotive plants to aviation work.

Harry J. Roesch, of Briggs' industrial relations department, revealed that Briggs has set up a highly efficient training school in which the trainees, after a break-in period, are taught by working on actual production of parts in a special school department. Students work in small groups, each group under the supervision of one practical shop man and one graduate mechanical or aeronautical engineer. All the parts they make are subject to Briggs' regular inspection procedure and also Navy inspection. They are shipped out as part of the regular production.

In addition to the training there is a system of upgrading of the more skilled men to jobs requiring their skill. As a means of creating better industrial morale, Briggs is currently expending \$35,000 in the production of motion pictures which will acquaint the workmen with the job they are doing, and outside circumstances, including problems of

(CONTINUED ON PAGE 130)

BUYING TRENDS IN METAL-WORKING FIRMS IN DETROIT



Data from PURCHASING AGENTS ASSOCIATION, DETROIT; Data cover wide industrial field, including stove, refrigerator office equipment, steel, auto parts, accessory, auto plants, etc.

It opened the door to FASTER PRODUCTION of Stainless Parts

WHEN you step into the shop today, and see the ease and speed with which parts are machined from Stainless Steel, it is hard to realize the difficulties that have been overcome.

But remember when shop men cussed and sweated over Stainless jobs that today are commonplace? Tools broke, rejects were high, speeds were slow, and costs were prohibitive.

Such was the picture when the first Free Machining

Stainless Steel was invented by Carpenter. It marked the dawn of a new era in Stainless progress. *Down* came the costs of using Stainless, as cutting speeds were increased and tool problems disappeared. The door was thrown wide open to corrosion protection for thousands of additional products.

Today this important Carpenter development is playing an important part in speeding the production of vital Stainless parts for defense equipment.

After the emergency, Carpenter Free Machining Stainless Steel will play an equally important part in improving performance and stimulating sales for many a peacetime product.

Meanwhile, consider Carpenter as your headquarters for any information on the fabrication of Stainless Steels.



THE CARPENTER STEEL COMPANY • READING, PA.

Carpenter STAINLESS STEELS

BRANCHES AT Chicago, Cleveland, Detroit, Hartford, St. Louis, Indianapolis, New York, Philadelphia

Washington . . .

• Drain on ingot supply same regardless of which steel product is allocated . . . Inventory control fails to provide answers to question of "ingot hogging" . . . Pipe line controversy illustrates broader problem.



WASHINGTON.—"It all goes back to the ingot."

This is more than a steel industry slogan. It is a hard, inescapable fact. No matter what may be the product to be rolled, forged or cast, the manufactured raw product is the ingot.

It represents the country's steel-making capacity, about which so much has been and will continue to be heard. Hence, whether there is demand for blooms, or for wire for watch springs, the source is the ingot and there is no way of switching demand from one product to another without making a drain, small or heavy, on the steelmaking capacity whose increase could be limitless and still the ardent expansionist would cry for more.

ALL this is to lead up to the action taken last week by SPAB. It turned thumbs down on the request of Harold L. Ickes, the fiery Petroleum Coordinator, for priorities on plates, estimated at 450,000 to 700,000 tons, for the construction of an 1820-mile oil pipe line from west Texas to Philadelphia and New York, 1200 miles to be built of 24-in. sections.

SPAB said the plates were more urgently needed for ship and railroad car construction. But straddling the issue, the agency indicated that, after making formal application, Mr. Ickes might be allowed steel for the manufacture of seamless tubes for building of the

line. Correctly, the thought was that by this device, there would be no diversion of plates for freight cars and merchant and naval ships.

But from a point of steelmaking capacity, this is a case of the ostrich burying its head in the sand. For if priority is granted on steel for the production of seamless tubing, the pull on the ingot is not relieved in the least. This is not to pass upon the merits of the pipe line project, to engage in the hot controversy of a gasoline shortage in the East. Whether it is phony as some sources claim or whether it is real and desperate as Mr. Ickes and his subordinates maintain.

THAT problem was not formally before SPAB. Yet to say whether Mr. Ickes can or can not have steel for seamless tubing will mean passing upon the question whether construction of the pipe line is a necessity as a national defense project, as alleged by Mr. Ickes.

If the project is approved, the supposition is that the steel will be given a high priority rating since it is to be assumed that construction work should begin immediately, though there are sources which think Mr. Ickes will have to wait before getting his steel in order that other demands may first be cleared. Then, of course, there are those who believe the project will be entirely abandoned despite heated insistence for its construction by Mr. Ickes.

If the request is granted for priority ratings for a seamless pipe line for immediate construction there arises another serious question. There is only one maker—the National Tube Co.—that produces 24-in. seamless tubing. This company is heavily engaged, according to official circles, in making bombs and shell casings, highly important work which would be interfered with if the company were called upon to make seamless tubes for the pipe line.

It would take time, steel and equipment from pressing defense production, and at best it is said the pipe line could not be completed for about a year. Mr. Ickes' office itself has estimated that even under the most favorable circumstances it will not be likely that more than 70 per cent of total steel tonnage and 50 per cent of alloy material for the 1820-mile line and other

projects will be available during the fiscal year which began July 1.

THE situation is only an index to the whole broad problem of steel allocation. Whatever the merits of the controversy over the pipe line projects, the board is called upon to let first things come first. Switching from one type of steel to another is a makeshift and there-



U. S. MISSION TO MOSCOW: Above are four members of the 5-man mission appointed by President Roosevelt to visit Moscow to get information about Russia's needs for war equipment. At top left is Admiral William H. Standley, U.S.N. (retired); top right, W. Averell Harriman, the President's Lease - Lend representative in London; lower left, Maj. Gen. George H. Brett, and lower right, William L. Batt, Director of the OPM's materials division.

fore is not a solution. Fundamentally there is need to determine whether some defense consumers are "hogging the ingot."

Inventory control was supposed to offer an answer to this question but there is no sign that it has accomplished its purpose. Nor has there been any figures given out to show just where steel production is



"Indoor daylight" in this plant is provided by fluorescent industrial units equipped with 48-inch G-E MAZDA F Daylight lamps.

V MEANS VISIBILITY AND VICTORY

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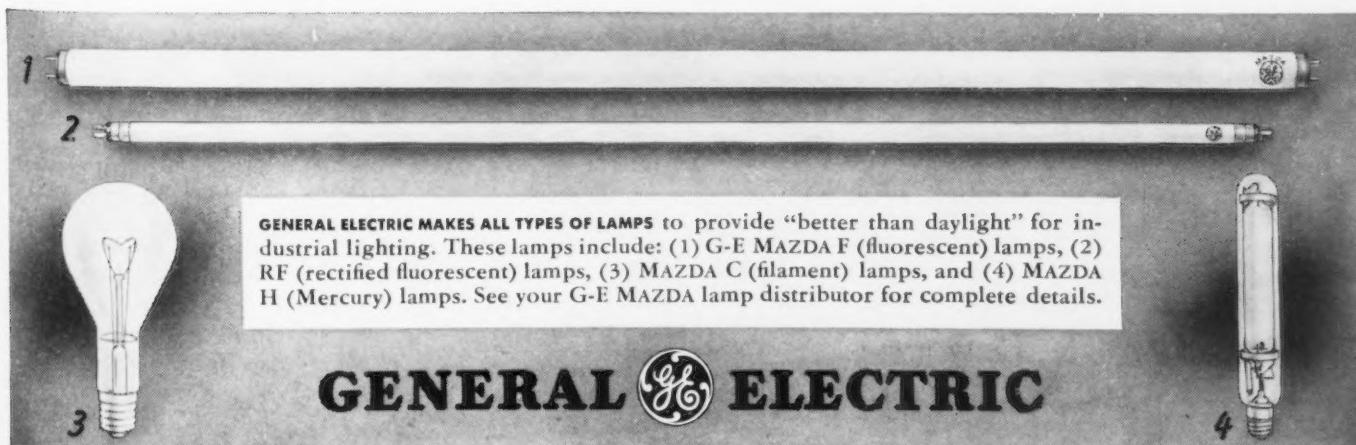
MORE THAN 50 FOOTCANDLES of cool, even "indoor daylight" floods the screw machine department of this defense industry... one of the many plants that are using G-E MAZDA F (fluorescent) lighting to help craftsmen see better and do more accurate work without loss of time and waste through error.

Find out how General Electric can help you speed production, reduce errors, and improve morale in your plant with higher level lighting that is "better than day-

light" because it is efficient, economical, and dependable 24 hours a day. Your local electric service company or your G-E MAZDA lamp distributor will show you how to get 50 to 100 footcandles of light, either with incandescent, mercury, RF, or G-E MAZDA F lamps.

* * *

For further information, write General Electric Company, Dept. 166-IA-1, Nela Park, Cleveland, Ohio.



GENERAL ELECTRIC MAKES ALL TYPES OF LAMPS to provide "better than daylight" for industrial lighting. These lamps include: (1) G-E MAZDA F (fluorescent) lamps, (2) RF (rectified fluorescent) lamps, (3) MAZDA C (filament) lamps, and (4) MAZDA H (Mercury) lamps. See your G-E MAZDA lamp distributor for complete details.

GENERAL  **ELECTRIC**

going. This could be made known in such a way as not to disclose any military information.

In the absence of such information there is a growing belief that there is an over-scheduling and excessive concentration of requirements. Whatever extreme expansionists may say, it is difficult to conceive that an 86,148,000-ton industry subjected to rigid priority control, and sharp civilian curtailment, is not capable of meeting defense needs, with something left over, even if the United States attempts to be a steel almoner to all powers that are fighting the Axis.

10 Machine Gun Plants Operating—Output Up 460%

Washington

• • • All 10 machine gun manufacturing facilities required for present estimated needs are now in operation and production has increased 460 per cent since August, 1940, according to the War Department.

Plants producing machine guns include four divisions of the Gen-

eral Motors Corp.: The Brown-Lipe-Chapin Division, Syracuse, N. Y.; the A.C. Spark Plug Division, Flint, Mich.; the Saginaw Steering Gear Division, Saginaw, Mich., and the Frigidaire Division, Dayton, Ohio.

Other plants producing machine guns are the High Standard Mfg. Co., New Haven, Conn.; Savage Arms Corp., Utica, N. Y.; Kelsey-Hayes Wheel Co., Detroit; Buffalo Arms Co., Buffalo; Colt's Patent Fire Arms Mfg. Co., Hartford, and the Ordnance Department Arsenal, Rock Island, Ill. The Colt plant and Rock Island Arsenal were the only facilities turning out machine guns for the United States armed forces in July, 1940.

Gray Iron Founders Society Opens Washington Office

Washington

• • • The Grey Iron Founders Society has opened an office here at 1622 H Street, N. W. Washington representative is W. W. Rose, executive vice-president of the society.

THE BULL OF THE WOODS

BY J. R. WILLIAMS



Photo by Wide World

OPPOSES PIPE LINES: Admiral Emory S. Land (above), chairman of the Maritime Commission, last week proposed before a special Senate committee investigating the gasoline shortage the construction of 100 oil-carrying barges to ease the shortage. He opposed the suggested building of a giant pipe line system (see *THE IRON AGE*, Sept. 4, p. 85).

OPM Adopts New Program Aiding Heavy Truck Output

Washington

• • • Basing its action on a contemplated increase of 200,000 units during the current model year, OPM has adopted a new program to facilitate production of heavy motor trucks, medium trucks and truck trailers. The new action does not make any major change in the motor truck order originally issued Aug. 30, but it does revise the enforcement and administration provisions of the previous order.

Limitation Order L-1-a includes specific instructions on the number and kind of trucks and allied products to be made from Sept. 1 to Nov. 30. Limited Preference Rating Order P-54 extends a rating of A-3 which can be used to get the material going into truck production.

Auto Schedules Cut Deeply for December

See "On The Assembly Line" page 82 for details of how one company is training men made idle by automotive curtailment.

Washington

• • • Slashed 48.4 per cent below the December, 1940, production of 396,823 cars, passenger automobile output for December, 1941, has been fixed at 204,848 units. Taken together with a 26.5 per cent cut ordered previously for August, September and October, the December, 1941, reduction means an overall curtailment of 32.2 per cent during the first five months of the model year that began Aug. 1. Production for the five-month period will be 1,023,217 cars, compared with 1,510,167 during the corresponding part of 1940.

For General Motors, Chrysler and Ford the December curtailment will average 51.5 per cent. For Studebaker, Hudson, Nash, Packard, Willys-Overland and Crosley the curtailment will be only 15.3 per cent.

The December reduction, OPM said, is timed to coincide with increased need for automobile workers in aircraft engine and other defense plants.

Steel House Moved From One Project to Another for \$360

Washington

• • • Demonstrating the adaptability of the all-steel defense house to conditions which might require its removal from one defense production area to another, one of the 58 all-steel demountable homes furnished to the Public Buildings Administration of Federal Works Agency, at its Indian Head, Maryland Project by the Tennessee Coal, Iron & Railroad Co., Birmingham, subsidiary of United States Steel Corp., was dismantled in 4 hr. and 40 min., carried by truck a distance of 32 miles, and re-erected under roof in three working hours. The dismantlement and re-erection consumed a total of 104 man hours, costing \$360.



The attention of industry is being called emphatically to the urgent need for accurate and rapid inspection at tolerances never before encountered in a period of rapidly expanding production.

In order to handle this tremendous volume of gaging operations with the highest degree of precision, gages such as the Sheffield Visual Gage are absolutely essential. The Visual Gage is highly sensitive, instantaneous in its action and deadly accurate (checking to thousandths, "tenths" and millions of an inch). It is used for checking dimensions of manufactured and purchased parts, tools, production and master gages.

At the same time it is very simple in construction, can be handled easily by anyone familiar with inspection work, and is extremely durable.

The Reed Mechanism (the heart of the Visual Gage) is positive in action and entirely free from the limitations of frictional wear. It contains no gears, knife edges or rubbing contacts—nothing to wear out of adjustment. Measurements by the Visual Gage are always consistent and thoroughly reliable. It is one of the most efficient instruments available to inspection.

Write for details

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WEST COAST . . .

- Improper sequence of deliveries delaying ship construction at four major yards in San Francisco . . . Oakland company lays men off and postpones the launching of a C-2 vessel.



San Francisco

FAILURE of mills to meet scheduled delivery dates, and delivery of steel in improper sequence, is delaying construction on Navy, Maritime Commission, and British ships at four major San Francisco Bay yards. No slowdown in construction has been made at the fifth yard, but steel deliveries are not meeting schedules.

If ships could be built from the top down, the situation would not be so serious, for steel for the latter stages of construction has been arriving, although behind schedule and short of tonnages ordered. Lack of plate steel for lower strakes, tank tops, lower decks, and parts of the bow are delaying construction to the extent that yards either are not laying keels, or have slowed down or brought work to a halt after keels have been laid. Yards with ships in advanced stages of construction report that inability of ship machinery contractors to make deliveries on time has disrupted work schedules and threatens to hold up delivery dates.

Moore Dry Dock Co., Oakland, contractor both for Navy and Maritime Commission C-2 cargo ships, was forced to lay off over 700 men last week and postpone launching of a C-2 for need of certain steel.

Todd - California Shipbuilding Corp., Richmond, Cal., building cargo vessels for Great Britain, has

been able to launch the first two ships of its contract only by drawing upon Pacific Coast warehouse stocks and by sending out scouts for critical parts. Boilers for these ships, installed before launching, had to be transferred from an affiliated yard in Bath, Maine, working on a similar contract and brought across the continent by a circuitous route to avoid railroad obstructions because the Los Angeles boiler fabricator was unable to obtain important fittings in time to make delivery. These Los Angeles boilers, upon completion, will have to make a similar journey to Maine as replacements. It is admitted at this yard that unless lagging steel and machinery deliveries pick up their feet, five more ships for Britain scheduled for delivery this year will not slide off the ways until 1942.

ALTHOUGH plates for the latter stages of construction of Maritime Commission emergency vessels are piling up in the yard of Richmond Shipbuilding Corp., Richmond, Cal., and material for keels has arrived, no keels have been laid for lack of steel for the stages of construction immediately subsequent. Delivery on this steel is as much as two and one-half months behind schedule, and although ways are in readiness at this new yard for that period of time, full labor crews will not be assembled, and keels laid until continued operation can be assured.

Western Pipe & Steel Co., South San Francisco, is short about 2500 tons of plates. Keels have been laid for two Maritime Commission C-3 cargo vessels on recently completed additional ways, but unless steel shipments improve further construction on these ships will continue under wraps. So far, no shifts have been cut. Causing havoc in work schedules at this yard, as at the yards of other contractors for earlier ships, has been irregularity of machinery deliveries after launching of hulls, making it difficult to keep outfitting crews together.

Only Bethlehem Shipbuilding Division, San Francisco, reports that it has not been held up for steel for its Navy contract, although this builder refuses to state deliveries have been made on schedule.

Reports from southern California and the Pacific Northwest, not

checked yet by THE IRON AGE, indicate a less acute shortage.

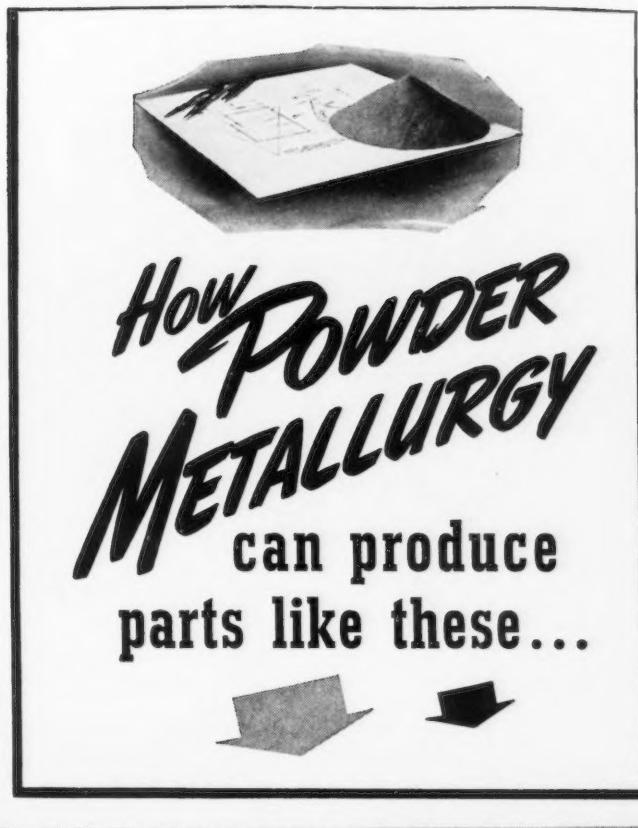
Puget Sound shipbuilders have been drawing heavily on stocks of Seattle jobbers, now nearly stripped, and so far have been working on schedule. No shortage is reported from Portland, Ore. Work on eight ships under construction at the yard of the California Shipbuilding Corp., Los Angeles harbor, has been slowed down, reports state.

Yards in the San Francisco Bay region reporting shortages are universal in emphasizing that, although they are working ahead of schedule, lack of needed steel is not due merely to failure of mills to keep in step with this accelerated pace, but rather to inability to meet slower normal delivery dates. The Maritime Commission reports that, so far, launching dates have not been postponed on the calendar.

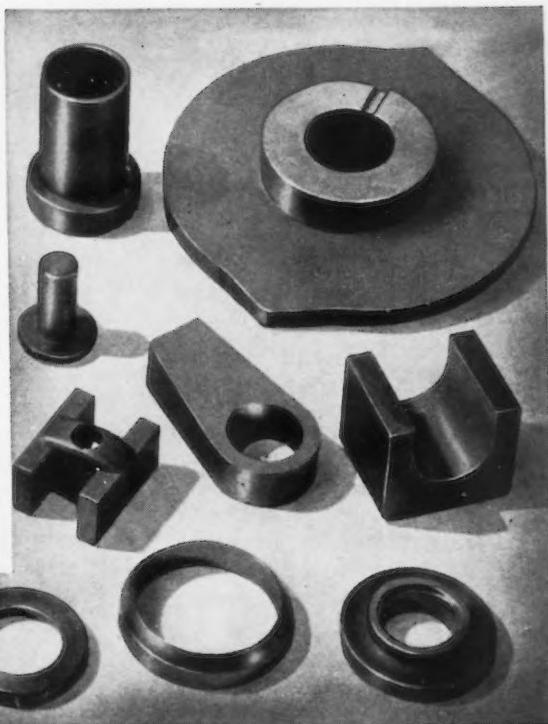
ONE shipbuilder was outspoken in his criticism of both the steel allocation system of the OPM and administration of allocation. He held that the present situation was evidence of lack of familiarity with either production abilities of the mills, the needs of shipbuilders, or of failure to mesh these two factors. This official, recollecting his shipbuilding experiences in the last war, said that he experienced much less difficulty at that time when every builder was fending for himself.

Some builders are inclined to criticize the mills for arranging rolling schedules to effect operating economies without regard to the sequence requirements of the shipyards, but others regard this as inevitable. One major steel company, in particular, came in for much criticism for causing a great deal of the delay, but it was not ascertained whether one or all of this mill's units were responsible. Builder after builder agreed that scheduling of sequence of deliveries has been faulty throughout the program.

Some feeling was evident that certain suppliers, not necessarily those of steel, are discriminating against West Coast yards. Evidence was given by one yard with Eastern affiliates that such machinery requirements as valves, fittings, and tubing deliveries were better on the East Coast than on the West. Certain valves and fittings are particu-



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MORAINÉ PRODUCTS DIVISION, GENERAL MOTORS CORPORATION, DAYTON, OHIO

NEWS OF THE WEST COAST

larly hard to obtain on this Coast. All admitted, to the belief, however, that even East Coast yards were not operating in a land of abundance.

A rumor that steel plate tonnage originally allocated to Pacific Coast shipbuilders would be diverted to Eastern builders is causing deep concern. Such a diversion, were it to occur in the face of present delays here for want of materials, would go far to change the present highly cooperative attitude to one of deep resentment.

Material and parts procurement difficulties in the aircraft industry were aired last week in the report for the first six months of 1941 by Lockheed Aircraft Corp. The report stated that although the peak in production of P-38 pursuit interceptors for the Army and the RAF, and Hudson bombers for the British, has been far from reached with present facilities, further rapid acceleration may be hampered by inability to procure outside manufactured parts and materials. The sources of these, the report said, have not expanded facilities as rapidly as the prime contractors. The company stated that deliveries for this six months' period exceeded by 25 per cent production for the full year of 1940 and were more than three times deliveries in the comparable six months of 1940. Lockheed sales for the six months ended June 30, 1941, totaled \$58,005,861. Sales for the full year of 1940 were \$44,936,594.

A tentative labor agreement was

reached last week by representatives of AFL employees of Lockheed, and its subsidiary Vega, and officials of the companies. The agreement is subject to approval of the government and union membership.

First flight tests of the Boeing B-17E, latest, largest, and most deadly of the Flying Fortress series, were under way at Seattle last week. The four-engined plane, first of a large number which will be produced also by Douglas and Vega in southern California, has power turrets both on the top and bottom of the fuselage and a stinger turret in the tail providing a resistance to attack from any direction.



Power Delivery Made to Longview Reduction Plant

Seattle

• • • Power delivery for the commencement of operations at the 60,000,000-lb. aluminum reduction plant of the Reynolds Metals Co. at Longview, Wash., was made Sept. 8 by the Bonneville Administration. The Reynolds plant will, when in full operation, together with the Aluminum Co. of America plant at Vancouver, Wash., bring Pacific Northwest aluminum production to over two hundred million pounds of pig metal annually.

Agitation is increasing for establishment of one or more aluminum fabricating plants on the Pacific Coast in addition to the

one now operated by the Aluminum Co. of America at Los Angeles. Nearly all aluminum now smelted in the Pacific Northwest must now be shipped east of the Mississippi River to be rolled into sheets or otherwise formed before it is available for use by Coast aircraft industries.

The Idaho Bureau of Mines has reported a large new alumina deposit near Priest River, Idaho.

The OPM last week recommended to the Defense Plant Corp. that the new government owned smelter to be operated in the Pacific Northwest by the Aluminum Co. of America be located at Troutdale, Ore. The plant, utilizing Bonneville power, will produce 90 million pounds of aluminum annually. Plans for this plant had been previously announced, but the tentative location at Cascade Locks, Ore., was later rejected as being unsuitable. Other new government owned plants to be operated by Union Carbide & Chemical Co. and the Olin Corp. will be located at Spokane, Wash., and Tacoma, Wash., respectively. Bohn Aluminum & Brass Co. will operate a government owned plant at Los Angeles.



Survey of Shortage on In Los Angeles Area

Los Angeles

• • • The Los Angeles Chamber of Commerce is making a detailed survey to determine the exact status of material shortages in this area, particularly among metal working shops. Strong charges of strangulation of small shops by the defense program have been published in Los Angeles newspapers.

Harold W. Wright, manager of the domestic trade department of the Chamber, told THE IRON AGE that "not many plants have ceased operating due to lack of materials, but in certain small plants men have been laid off, especially in those making building specialties and miscellaneous industrial equipment. There has been some reduction in employment in consumer goods manufacturing, such as stoves, heaters, etc."

"A good many more plants say that if the present trend continues for 30 days longer, they will be forced to lay off many more."

HITLER'S TROOPS DIG IN: Unable to make any progress against fierce Russian resistance, this German mechanized division is digging itself in.

Photo by British Combine





Tanks enough for an Armored Division...

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American Chemical Paint Company, with more than 20 years' experience in the development of chemicals for saving and protecting steel, offers you the experience of their research and manufacturing facilities to conserve steel. Adequate stocks are available to meet your demands. Write for Bulletin No. 13.

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Fatigue Cracks

BY A. H. DIX • • •

He Upped Himself Two Inches

• • • Aside from the time Wallace Beery stepped on our foot in the old French Casino and said "Pardon me," and the intimate two-second get-together we had with Alfred P. Sloan when we were 2017th in line at the last General Motors preview, our contacts with big shots have been limited. But that has not prevented us from building up a mental picture of a true big shot as one who is not awed by his own importance, who is easy to meet, who has a passion for facts, a lively sense of humor, and a mind that never age-hardens beyond 160 Brinell.

So we were happy to learn from Jim Rowan, our news editor, who had an exclusive interview last week with Bernard Mannes Baruch, that the great Barney fits the pattern like a sarong fits Lamour.

Jim heard a radio commentator say B.B. regards industrial production as the weak point in the defense program. "Were you," he inquired over the telephone, "quoted correctly?" When B.B. answered, "I was," Jim followed up with, "I'd like to talk to you about it face to face." B.B. said, "Come ahead. I'm a good-looking guy. But wait a few days till I get back from Saratoga."

Tempus fugits about 96 hours. Jim phoned again. "I'm going to Washington today," B.B. told him. "Meet me at the Penn station information booth and go along with me. I'm six foot five and all the redcaps know me." It was as simple as that. When Jim met him he was accompanied by his "secretary," a heavy-set gentleman with big muscles, thick soles, and fingers that never caressed a keyboard.

Jim found him as frank and easy as a cruise director. No "side." No pussyfooting. You saw the outcome of the drawing room session on pages 85-88 of last week's issue. But he is only about six foot three.

Who's That Tapping on My Floor?

Is the colored gentleman in the photograph on page 70 of the Aug. 21 issue a tapdancer?

A.B.C., Detroit

We put it up to Leon Wesley Moffett, our Washington editor (see page 86), who took time out of his busy day to investigate. He finds that this White House attendant's idol is Bill Robinson, and he is just taking advantage of the opportunity to practice Pose No. 7.



Helpers Three

• • • This page's army of eighteen loyal readers worked overtime this week and has piled our desk high with three contributions. W. H. (Carnation Co.) Brooks thinks you should know that according to the *Patent Office Gazette* a man namer Panzer has perfected, not a mechanized division, but an ash tray of new design.

Keith Misegades sneers at this use of the word stressed in Arthur D. Little, Inc.'s July industrial bulletin, "In processed foods molasses can be either stressed because of its distinctiveness or blended inconspicuously with other flavors." "Next we'll be using molasses," he comments acidly, "for screw stock and deep drawing."

Into our aptronym pot W.A.M. tosses this clue chip: A prof at Harvard named Edwin G. Boring is collaborator on a book called "Germany's Psychological Warfare." Would you say this is boring from within?

Hospital Bait

The man holding the bar in the photo on page 81 of the Aug. 28 issue is in a good position to have his back smashed in—if the man with the hammer misses. Even 40



years ago around the blast furnaces we knew better than that. Either the hammer man or the bar holder should change sides to prevent an accident.

—John Howard, E. J. Lavino & Co.

The bar holder knows what he is doing. He is a Dodger fan and his heroes had just dropped a double-header. At the time the picture was taken he just didn't g. a d.

Little Bird Sings

• • • A little bird has just told us that your favorite family journal again has copped an award for editorial excellence in the annual contest conducted by *Industrial Marketing*, the trade papers' trade paper.

If the little bird is telling the truth, this will be our fourth consecutive home run. As the contest has been running only four years, our batting average makes DiMaggio's look like a nearsighted sandlotter's the day he left his bifocals on the bureau.

We will crow about this at length later when we get the details, always assuming, of course, that the bird isn't lying. If it is, we will wring its neck offstage, and you won't hear a peep.

Puzzles

At this writing we don't know the answer to last week's scalp denuder, as A. W. Kelly, who submitted it, did not give us the answer and none of the master minds has yet been heard from.

Wm. Flarren says that if you toss two pennies 300 times, they will come up heads and tails 150 times, both heads 75, and both tails 75. H. J. (Wall Wire Products Co.) Quagline makes it 100 of each. Our puzzle book agrees with Mr. Flarren, but some rainy Sunday we will test it.

If you can fill in the blanks below in less than a half hour you are underpaid:

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This Industrial Week . . .

• • •

LABOR LEADERS in the U. S. this week were again on the march, following President Roosevelt's promise of a "torrent" of ships, planes, tanks and other war equipment for the anti-Hitler countries with actual work stoppages and with threats of more strikes.

Union leaders, regardless of the attitude of rank and file union members and of non-union workmen, seemed again to have the power to anaesthetize the defense program and reduce the President's production torrent to an inconsequential trickle.

Calling of the CIO strike in captive mines producing coal for the nation's steel plants at midweek seemed so dangerous to the national defense program that it could not be permitted to continue long.

In this same classification are union dues drives such as that which on Tuesday struck at the heart of steel production in the Pittsburgh area, the vital by-product coke works at Clairton, Pa. This important plant manufactures coke and oven gas used in Carnegie-Illinois Steel Corp.'s big district steel plants like that at Homestead, Pa. The stoppage began when operators of coke oven batteries sat down, refusing to work with non-dues paying men. (On Feb. 27, 1939, the U. S. Supreme Court ruled the sit-down strike illegal.)

Still another danger to continued high steel production lies in unpublicized strikes and slowdowns in various plants. One steel manufacturer this week told THE IRON AGE that, since Jan. 1, the steel industry has lost the equivalent of one month's production from these

wildcat strikes which often are called without the approval or knowledge of union leaders. But the most important developments in the labor situation are likely to come in the contract negotiations between the Steel Workers Organizing Committee and some of the large "Little Steel" companies

such as Bethlehem Steel Co., Republic Steel Corp., Inland Steel Co. and Youngstown Sheet & Tube Co. One demand being made by the SWOC—Here is the most vital issue in management-labor dealings in these times—is for the union shop. Opposing the CIO's industrial union of Marine & Shipbuilding Workers in its demand for a union shop at Federal Shipbuilding & Drydock Co.'s, Kearny, N. J., shipyards, the Federal Company (a U. S. Steel Corp. subsidiary) recently lost the management of its shipbuilding

business to the Navy. If the National Defense Mediation Board, which supported the ship union, stands its ground and upholds the CIO's Steel Workers Organizing Committee in its request for a union shop in the steel industry, a new chapter in union history is opening. The Mediation Board which, a Labor Department conciliator said last week, "is becoming annoyed at the number of comparatively small differences it is asked to settle," may have in the "union-shop-in-steel" case a problem which will not be small.

Not in years has industry confronted more or bigger problems in a single week. After 15 months of defense effort, the new Supplies Priorities and Allocations Board,

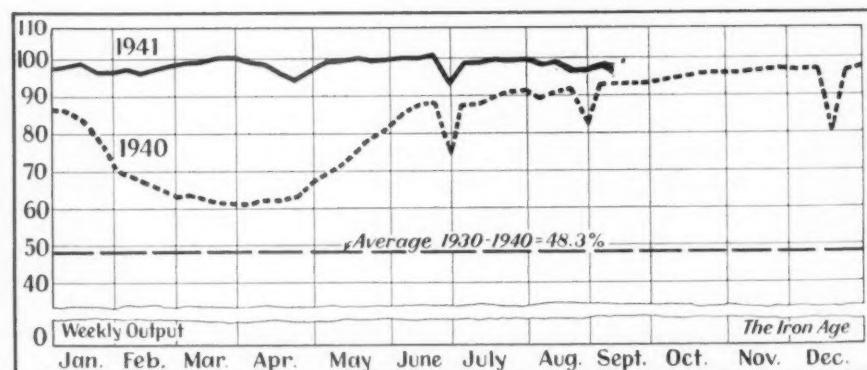
headed by Donald M. Nelson, acknowledges that accurate, coordinated knowledge of actual military and civilian needs is still a missing link in the defense picture. To the metalworking industry, this "link" seemed more like an entire chain, but Mr. Nelson's order for the drawing up by the SPAB staff of long-range schedules of both military and civilian requirements was cheering. This step by SPAB was described as an attack against the problems of shortages of essential materials and expansion of productive facilities. It calls for a detailed outline of both civilian and military needs and a breakdown into raw material, machinery and labor classifications.

At Chicago, more than 5000 harassed small businessmen, seeking to keep their plants going and their employees working, have just ended a meeting with prime contractors and defense agency officials only to conclude that: "We're getting a lot of speeches and fancy resolutions and no help to keep our doors open. All they (government leaders and others) want us to do is to have a (Congressional) investigation. We'll all starve while they're investigating."

Grasping at straws, non-defense plant managers noted that a proposal to ease the impact of priorities upon small industries is carried in a bill (Senator O'Mahoney's) providing that any person adversely affected by priorities could appeal to a special agency to be created by the President.

Steel Ingot Production—Per Cent of Capacity

(Open Hearth, Bessemer and Electric Ingots)



Steel Ingot Production, by Districts—Per Cent of Capacity

	Pitts- burgh	Chi- cago	Val- leys	Phila- delphia	Cleve- land	Buf- falo	Wheel- ing	De- troit	South- ern	S.Ohio River	West- ern	St. Louis	East- ern	Aggre- gate
Current Week.....	95.0	100.0	99.0	91.0	98.0	104.5	91.0	106.0	98.5	97.0	98.0	108.0	102.0	95.5
Previous Week....	100.0	101.0	96.0	91.0	96.0	104.5	91.0	112.5	96.5	98.0	99.0	108.0	110.0	97.5

The bill provides that, after hearings, the President "shall allocate to such persons such amounts of the material with respect to which the shortage exists as in his judgment will be necessary to prevent substantial hardship to such person, his employees, or consumers."

Hardest-hit of the industrial areas, due to lack of defense orders and material, apparently are in Indiana and Illinois, with fewer manufacturers in the Eastern states seriously affected so far. The OPM Priorities Field Service,

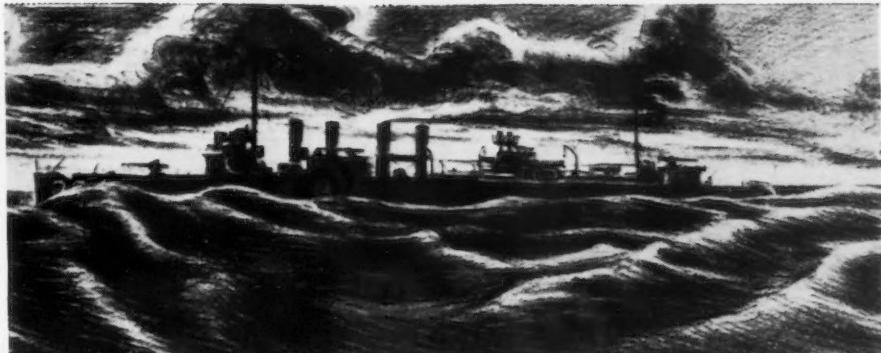
in opening a new New York City office, declared this week that no specific instances of companies forced to close through lack of materials have yet come to light in the New York area. Farming out of orders by large defense prime contractors is reported farther along in the East than in the Midwest and other sections.

With demand for steel ever rising, ingot production this week declined two points to 95.5 per cent from 97½ per cent last week, chiefly because of a five-point decline to 95 per cent at Pittsburgh and a one-point drop to 100 per cent at Chicago. The sitdown strike, plus the pig iron and scrap deficiency, are responsible for the Pittsburgh decline. Steel makers in Northern plants are already plagued with fears that cold weather will weaken open hearth schedules by slowing scrap collections. Scrap supplies needed to maintain the continued high steel melting rate are not being built up as is usual at this season.

While September steel shipments covering American and British defense needs are running more than 50 per cent of the total tonnage shipped, recent orders from Washington granting additional priority ratings

Priorities On Tin Plate Next

are likely to push the total of defense rated business in October shipments to from 70 to 75 per cent. When September tentative shipments were analyzed, such business as warehouse requirements, steel drum needs, repair and maintenance



TORPEDO TARGET: This lithograph shows the U. S. destroyer Greer which the Navy Department last week announced was attacked by a submarine while enroute to Iceland with mail. The Greer is one of the Navy's oldest destroyers.

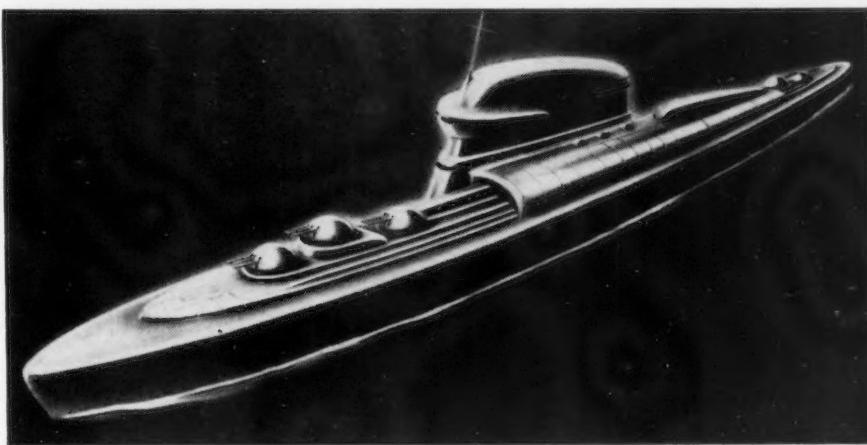


Photo by Wide World

BATTLESHIP TO COME: Warships of the future, decks, gun turrets and superstructure streamlined, will look like this, according to George W. Walker, Detroit designer. The ship (a model is displayed at the Navy exhibit at the Michigan State fair) will offer no flat surfaces to enemy projectiles and will be much faster than the modern vessel.

specifications and farm equipment did not carry an OPM rating symbol, although many companies considered such steel business as indirect defense work. A priority rating expected soon on tin plate for food packaging will lengthen the list of steel requirements coming under the headings of direct and indirect national defense.

Pig iron consumers are looking with anxiety to October when some of them will find pig iron supplies unavailable. However, many pig iron users with priority ratings no better than B-1 have been surprised at the generous treatment accorded their needs in the September pig iron schedule and are praising the OPM for its efficiency in placing the pig iron priority on a working basis. Pressure is increasing for a change in the pig iron pricing order so as to allow for an F. O. B. price plus

transportation from the producing blast furnace. Domestic ferromanganese and other major ferroalloy prices have been reaffirmed for fourth quarter shipment.

The shortage of steel plates is holding freight car production to 28 per cent of capacity against a backlog of 70,000 cars and is slowing ship production, particularly on the West Coast, where four yards report delays due to inability to obtain steel in the proper sequence. A step taken in part to divert steel to plate production is a further slash in passenger automobile output. Automobile production for December has been set at 204,848 units, compared with 396,823 units in December, a year ago.

Fabricated structural steel awards dropped to 15,600 tons from 19,850 tons last week.



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AMERICAN IRON AND STEEL WORKS
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News of Industry . . .



Small Plants Bitter As Chicago Meeting Ends Without Action

Chicago

• • • On four successive days here last week more than 5000 harassed small businessmen, some of them facing shutdowns, met with government officials and prime contractors and held sessions with each other in an effort to save their businesses. Judging from the comments voiced to THE

IRON AGE by both large and small business representatives, the meeting blew up in the face of those they were intended to help.

After a priorities meeting Tuesday attended by 3,500 manufacturers, a Wednesday meeting of 500 small businessmen and a Thursday all-day personal-contact clinic between prime contractors and potential sub-contractors, the climax came on Friday at a meeting of industry, labor and municipal governments, 1,500 strong. The little businessman was whirled through a hectic pace. And on the last day, he exploded.

"We're getting a lot of speeches

STILL NO REAL ANSWER:
Shown above are some of the 1500 businessmen, many of them heads of small plants unable to get defense orders or vital materials, who met last week at Chicago to learn what is to happen to them. They were offered a congressional investigation.

and fancy resolutions and no help to keep our doors open," was the consensus of disgruntled comments after it was all over.

The Friday meeting had been called at the instigation of the mayor of Evansville, Ind., one of



DEFENSE CLINIC: The top picture shows the OPM table at Chicago's clinic for small businessmen seeking lifesaving defense sub-contracts. Center photo—Order-hungry industrialists crowd the tables of the British Purchasing Commission, Chicago Ordnance district and the Kellogg Switchboard & Supply Co. Below—Actual parts General Electric Co.'s Ft. Wayne, Ind. works wants to subcontract. This display of aircraft parts was the only one exhibited by a prime contractor at Chicago's Personal-Contact clinic.

five cities designated by OPM as most likely to suffer greatly from priorities. Mayors from Ohio, Indiana, Illinois, Wisconsin, Michigan, Minnesota, Iowa, Missouri, Oklahoma, Kansas and Nebraska had been invited to attend the "Mid-west Emergency Conference on Unemployment Due to Priorities." About 100 mayors turned up, and the remaining 1,500 were small businessmen and union representatives. Each group met separately to devise specific recommendations to be approved by the entire assemblage. The industrial section had no more than convened when an association representative moved the approval of a resolution for a congressional investigation of the situation—and the meeting's real purpose quickly evaporated.

"All they want to do is have an investigation. We'll all starve while they're investigating," two businessmen told THE IRON AGE.

"We thought these meetings would help us get orders; instead they're doing a lot of political tub-thumping," remarked a Chicago man.

From a furnace pipe maker, Peoria, Ill.: "None of us know what to do about our plight and the fellows leading these meetings don't seem to know, either."

Said a representative of a Ft. Wayne electrical works, which had exhibited at the clinic the day before: "Attendance at the clinic yesterday was a disappointment. We were unable to line up subcontractors and now this meeting again shows that there is no adequate leadership to help the little businessman in his plight."

Bewildered and bitter were the small businessmen who had sat through the four days of meetings, and got nothing tangible to solve their problem. Only word of cheer came at the last meeting attended by all groups Friday afternoon, when Rep. Melvin J. Maas (R., Minn.), advocated: (1) an organization to gather facts to be presented to the Federal government; (2) a joint Senate-House committee to review the entire priorities situation; (3) allocation of materials to non-defense industries.

Following his speech, Maas, senior member of Naval Affairs Committee, told THE IRON AGE: "Allocating materials to non-de-

THIS WEEK'S

Priorities and Prices

fense is the only course for the present and in the long run. It will prove to be the quickest and cheapest solution to the whole problem, even though it may raise the unit cost of defense at first. If this isn't done, we will see greater centralization of control accrue during this emergency and following it, Socialism.

Rep. Mass also told his audience that Britain had not given adequate assurances it was not converting Lend-Lease materials for export sale; and that the administration would have to determine that the defense program is to perpetuate the American way.

Out of separate and combined meetings of labor, industry and civic leaders came nothing but resolutions for investigation. The mayors suggested a committee of 18, equally divided among the three groups, to ascertain the facts. Labor promised its full support to industry and asked for an allocation of defense orders by territories. The industrial group, unable to decide for itself, learned to its surprise that a quickly-appointed committee allowed 15 minutes to prepare a suggestion, had in desperation adopted the resolution in principle which threw the industrial meeting into an uproar.

This resolution, which small businessmen declared was just another stall, had been adopted on Wednesday at a meeting of the Illinois Small Business Men's Association. It was advanced by Fred A. Virkus, president, and recommended that a congressional committee be appointed to get the facts for small business on: (1) production, imports and exports of critical materials; (2) the quantities of critical materials exported and earmarked for future export under the Lend-Lease act; (3) what becomes of these critical materials; (4) how much hoarding and bootlegging of materials exists; (5) elimination of overlapping federal bureaus and establishment of a single head for defense.

Virkus declared, "I wonder if, when a man is desperate and is saved by an armament order, he won't begin to feel that perhaps pushing this country into war isn't a good thing after all, if it saves him? Has the psychology been planned that way?"

What should have been the highlight of the week, the Pesonal-

Strainless steel scrap data are sought in new survey of all fabricators and manufacturers of alloy steels. An effort is to be made to improve segregation and identification of alloy scrap to increase usable supplies. (OPM-PM1136)

Lead pencil makers voluntarily adopt a simplification and conservation program which will result in an initial saving of about 350,000 lb. of brass a year. (OPM-PM1134)

Steel shipping container priority rating for September and October described as applying to steel for all containers for all industries which normally buy their containers from the shipping container industry. (OPM-PM1135)

Old automobile scrapping program extended to Pennsylvania, New York, Maryland, Delaware, New Jersey and District of Columbia. Meetings are being held to devise ways of speeding up scrapping operations. (OPM-PM1125)

Twenty-eight industrial branches, corresponding to the old commodity sections, announced. Formation of the new divisions are a result of placing of civilian supply divisions under OPM jurisdiction. (OPM-PM1127)

Priorities unemployment in Kenosha, Wis., discussed at a meeting of local plant executives, defense contract holders and defense labor division. (OPM-PM1128)

Douglas fir lumber prices in the upper grades reduced an average of \$10 per 1000 board feet in price schedule No. 26 announced Sept. 11. (OPA-PM1124)

Expansion of productive capacity to meet purely civilian demand will not be permitted at this time if the expansion would require large quantities of defense material, it is announced, in explaining refusal of permission to expand Tennessee Eastman Corp. plastics plant at Kingsport, Tenn. (SPAB-SPA2)

Full schedules of military and civilian requirements sought as far in advance as possible in move by defense agencies to inaugurate new detailed planning of defense program to coordinate civilian and defense activities. (SPAB-SPA3)

New regulations issued which make all preference ratings mandatory and speed up process of issuing ratings. (OPM-PM1123)

Civilian airline requirements given limited blanket rating of A-3 to enable airlines maintain operating efficiency. Form PD-96 must be used in applying for such a rating. (OPM-PM1129)

Scarcity of material will result in 20,000 less new freight cars in service on Oct. 1 than previously expected, Transportation Division warns, in letter to railroads asking for greater utilization of existing equipment (OEM-PM1138)

Scrap steel sale by the City of New York at prices above OPA ceilings is to be investigated by city officials. (OPA-PM1146)

Pig tin which assays 99.8 per cent pure but which contains impurities exceeding the tolerances permitted for grade A tin has been classified as grade B metal in an amendment to price schedule No. 17 which set ceiling prices for tin. (OPA-PM1153)

Automobile production for December cut to 48.4 per cent of output of December, 1940. Manufacturers will be permitted to produce 204,848 cars in December under the latest cut.

Arc and resistance welder manufacturers granted preference rating of A-1-c to assist them in obtaining necessary supplies. Electrodes were not included in the order. (OPM-PM1143)

Hard coal prices for domestic sizes may not be increased 15c. a ton, as originally scheduled, according to an emergency price schedule issued Sept. 12. Lack of sufficient data to justify the increase was said to have caused the freezing action. (OPA-PM1141)

Heavy and medium motor truck and truck trailer production will be facilitated by new amendment to motor truck order originally announced Aug. 30. Order includes listing of number of units which may be made between Sept. 1 and Nov. 30 and extends limited preference rating of A-3 to truck makers. (OPM-PM1152)

★ ★ ★

For copies of above announcements address defense agency concerned, at Washington, giving announcement number as shown in brackets after each paragraph (OPM-PM1032 means announcement 1032 issued by Office of Production Management.)

NEWS OF INDUSTRY

Contact Clinic for potential sub-contractors to meet holders of prime defense contracts, proved a disappointment. Its sponsors, the Small Business Men's Association, laid the blame to lack of advance publicity. Over 400 prime contractors were invited by mail, with less than 5 per cent appearing. These were Athey Truss Wheel Co., Chicago; Chicago Hardware Foundry Co.; General Electric Co., Ft. Wayne; Independent Pneumatic Tool Co.; International Harvester Co.; C. R. Jahn Co., Chicago; Kellogg Switchboard & Supply Co., Chicago; Mercury Mfg. Co., Chicago; J. H. Phillips Co., Inc., Chicago; Pullman-Standard Car Mfg. Co.; Salvus Products Co., Chicago; Stewart-Warner Corp.; Union Railway Equipment Co., Chicago.

Though Chicago's newspapers reported that about 1000 potential sub-contractors appeared, there were actually much fewer than that. Representatives of both groups told THE IRON AGE that the clinic saw no contracts closed. An official of Mercury Mfg. Co., stated: "These small plants are not equipped to do a complete job. I believe their salvation lies in pooling community facilities.

"However, the ordnance department, represented at the clinic along with the British Purchasing Commission and the OPM, reported it had interviewed over 100, found that 25 per cent were capable of chipping in for defense.

Seekers of sub-contracts com-

plained that the turn-out of prime-contractors was too small, proving their long-held belief that the big fellows are not anxious to sub-let their work. Several bitterly asserted that there would be no widespread sub-contracting until it was rigidly demanded by law.



Political Opportunists Attacked by Small Business *Chicago*

• • • Assertions that some of the leaders in movements to bring aid to small business are making a political football out of the situation have been voiced to THE IRON AGE here.

"Political opportunists have seized upon our plight to stump for themselves in the guise of going to the front for us," one small plant operator said.

It is true much misleading information was voiced at meetings. One speaker told 500 business men there would be 67,000,000 tons of steel available in both 1941 and 1942 for domestic civilian use and export to countries other than England and Canada. No attempt was made to explain that much steel tonnage is going to "behind-the-lines" defense such as pipe lines, structurals, railroad materials, etc.

Assertions were frequently made that anyone can get "bootlegged steel" if "he'll pay the price," a statement which every steel man-

Army Lifts Ban on Imported Materials

Affecting manufacturers interested in marketing their products to national defense establishments, Army regulations have been revised lifting the prohibition on use of 143 different materials from other than domestic sources. These materials, ranging alphabetically from "abrasives" to "zirconium," may now be used regardless of their country of origin in the making of supplies or equipage for procurement by the Army.

ufacturer and informed consumer knows, with very rare exceptions, is untrue. Charges of steel hoarding were made so frequently that many small businessmen came away believing that every big corporation had steel stocks to last several years, while the little fellow was going begging.

The tone of many talks implied that small business was being pilloried on the cross of politics and of big business, hungry for defense work, as well.

OPM Says Steel Available For Variety of Containers *Washington*

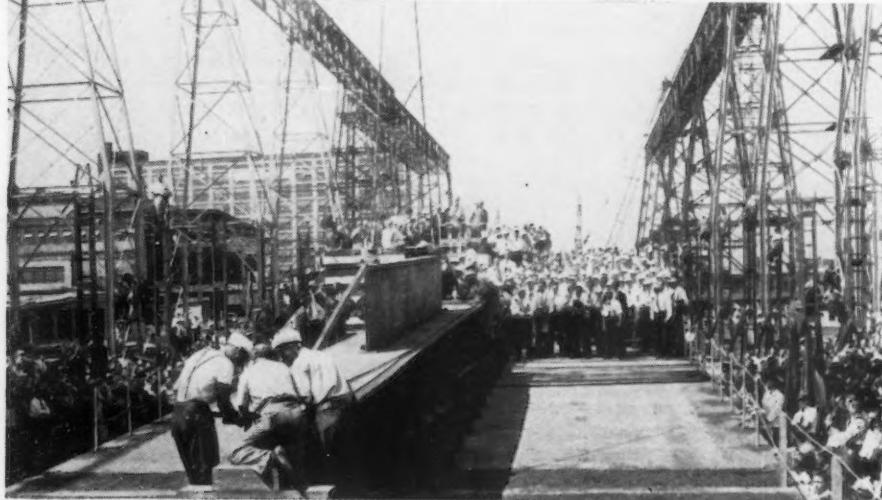
• • • Announcement was made last Friday by OPM that the priority rating recently granted to manufacturers of steel shipping containers for September and October makes steel available for the manufacture of containers for all industries which normally buy their containers from the steel shipping container industry.

The OPM statement was inspired by reports in the trade that the steel could be used only for making containers for the petroleum and chemical industries. OPM officials emphasize that steel may also be used to make containers for other industries, such as food processors, paint and varnish manufacturers, etc.

The priority rating granted covers two-thirds of the container industry's normal requirements of sheet steel, based on the monthly usage during the first half of 1941. While this priority covers only September and October, OPM is completing studies from which a continuing program will be developed.

BUILDING AT CRAMPS: Pictured below is the keel-laying of the new 10,000-ton cruiser Wilkes-Barre at the recently-reopened 111-year-old Cramp shipyard, Philadelphia.

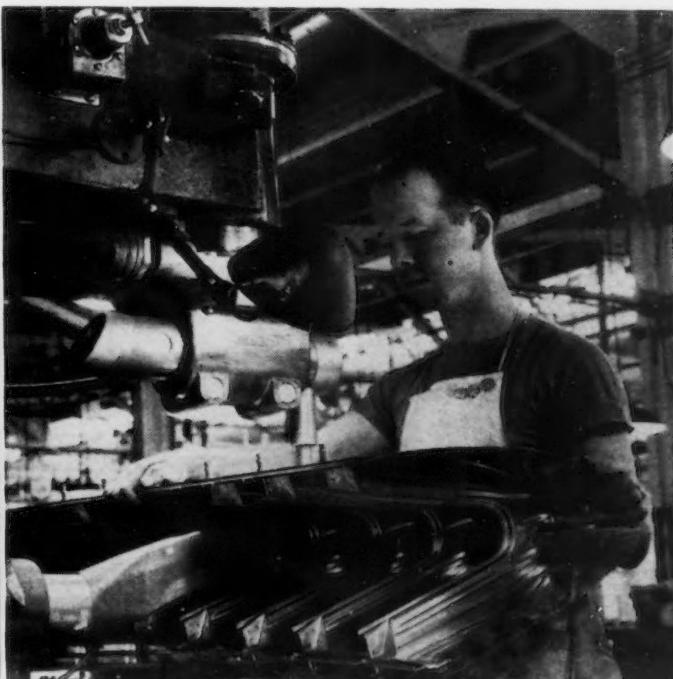
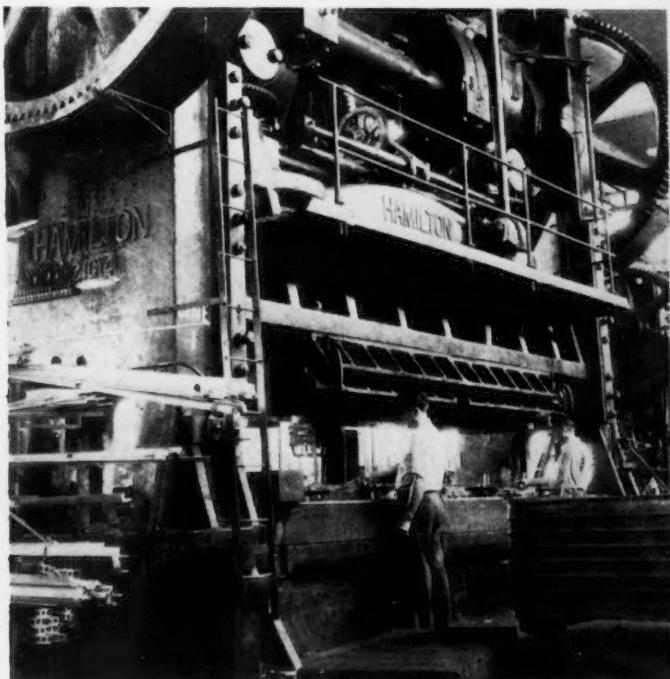
Photo by International



NEWS OF INDUSTRY



DEFENSE SPEED-UP AT DETROIT: First machines (top of page) have been delivered to the Ford Motor Co.'s Willow Run bomber plant near Ypsilanti, Mich. The plant will turn out 4-engined bombers early in 1942. Left above—The Oelerikon anti-aircraft gun to defend Navy vessels and merchant ships against dive bombers will be built by Hudson in the \$20 million Naval ordnance plant near Detroit. Left below—Formerly used to make automobile frames, this 1600-ton Hamilton press is helping to turn out 8000 different stampings at Briggs for Vought-Sikorsky wings, Boeing flaps and ducts and Douglas wings. Right below—Spot welding leading edge section for Vought-Sikorsky wings, said to be first application ever made of auto spot welding methods to airplane manufacture. Above — Multiple spot welding with work carried on a roller conveyor (table type) in Briggs Mfg. Co. aviation plant. Aluminum sheeting is being spot welded to stringers for Vought-Sikorsky wings.



No New York Plants Closed Yet, OPM Says

• • • Familiarity with "undue hardship" clauses and the right to make appeals from priorities orders would prove valuable for manufacturers occasionally, officials of OPM said last Monday at the opening of new quarters for the New York City office of the Priorities Field Service. The office, which serves Northern New Jersey, New York state and Fairfield County, Conn., is now at 25 Broad Street, with more space and a greatly enlarged staff.

Where lack of \$200 worth of material may delay production of a \$40,000 order, the "undue hardship" clause might be invoked to solve the problem of a manufacturer, it was stated.

Phillip M. McCullough, eastern area coordinator, and E. C. Laird, Jr., assistant deputy administrator, both from Washington, conducted a press conference in the new office quarters, and discussed recent basic changes in the priorities system.

Some firms would like to have the priority system supplant their purchasing department and others have it supplant their shipping departments, the officials pointed out. Majority of callers simply say, "Give me a priority number from one to 10," without giving essential details of their businesses.

In New York City alone, it was

stated, there are about 18 offices where preference certificates may be issued under the Army and Navy critical list.

"It may be said specifically that there will be increasing efforts to find out the facts about inventories and keep them at reasonable levels, to prevent hoarding and to conserve critical materials," Mr. Laird said.

No specific instances of companies forced to close down through lack of materials have come to light yet in the New York district, it was asserted. Several project orders have been issued, one to a sewing machine company in New Jersey which needed additional space for its regular non-defense production due to the fact its defense production has risen. The Battery-Brooklyn tunnel has applied for a project rating based on the theory of military necessity. Requirements for these ratings are studied in the light of three questions: Why do it at all? Why do it now? Why do it in the manner recommended?

Mr. McCullough defined M, P and E orders as follows: The M series provides mandatory control of raw materials; the E series applies to distribution of finished goods, and the P series is made up of general preference orders given companies, industries or projects for a specific purpose, for a specific product and for a specific length of time.

At New York late this week a

Civilian and National Defense Exposition will open in Grand Central Palace, Sept. 20. The show will run continuously until Oct. 18. On Sept. 22, 23 and 24, a defense clinic will be held, which is expected to be larger than any previously held by OPM. Emphasis will be laid upon prime contractors bringing with them actual parts which they want to "farm out." Firms desiring subcontracts will have the opportunity of examining the parts and talking to the prime contractors.

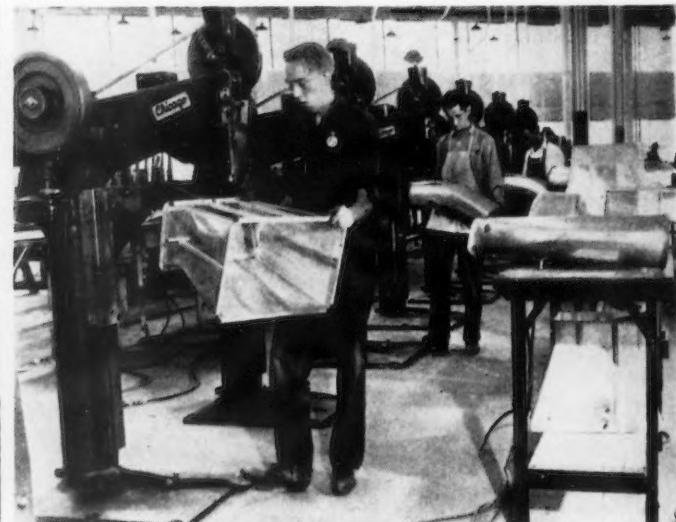
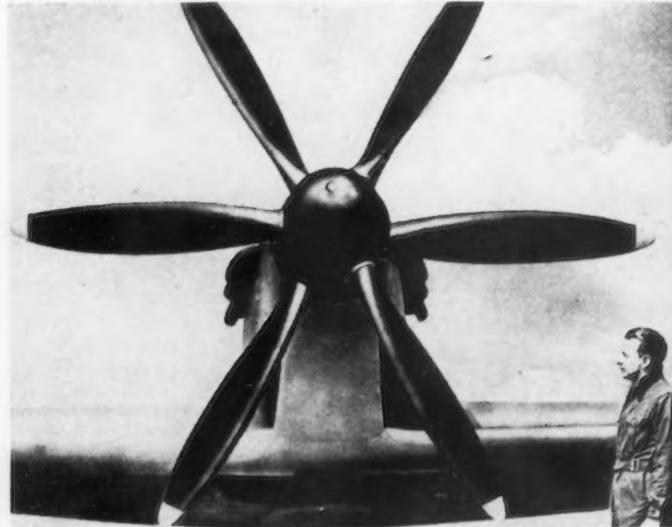
Armco Starts Coke Ovens, Plans New Gas Pipe Line

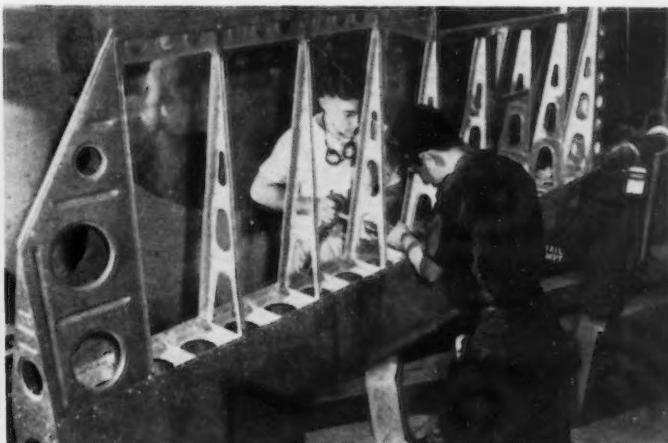
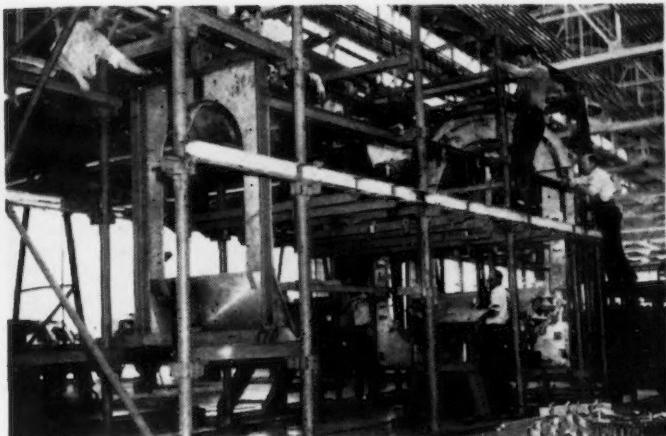
Hamilton

• • • A new battery of 25 coke ovens has been placed in operation at the Hamilton Iron & Coke unit of the American Rolling Mill Co. Full production on these ovens has not yet gotten under way, but is gradually being increased. At the same time, this unit announced plans for construction of a pipe line from Hamilton to Middletown, to convey surplus gas to the rolling mill there. The company is considering the purchase of an old traction line right of way from Hamilton to Middletown and upon completion of a contract with the public officials owning this line, work upon the new gas line will begin at once.

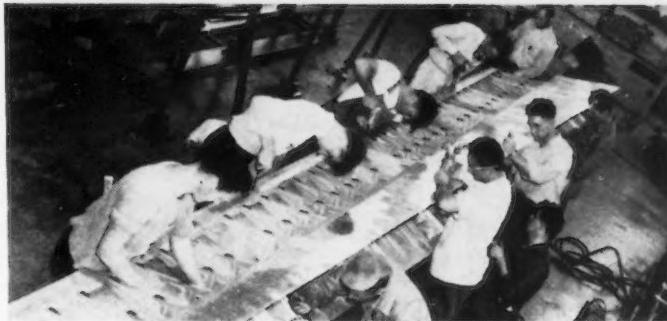
LATEST PROPELLER: The latest development (left) in plane propellers is this British Rotol constant-speed contra-rotating air screw. Although the photo gives the impression of a six-bladed propeller, two air-screws of three blades each rotate in opposite directions. At the right ducts for Boeing flying fortress are being riveted at a Detroit plant.

Photo by British Combe





BOMBERS BY FORD: To smooth out production procedure, Ford Motor Co. will produce assemblies for 10 Consolidated B-24D bombers at its old plane plant at Ford Airport, Dearborn, Mich. Top left—one of the Consolidated jigs for assembling the fuselage of the B-24D. Shown are aircraft production engineers studying procedure to be used at the new \$70 million Willow Run bomber plant. Right, top and bottom—Ford apprentices learn to rivet aluminum alloy parts for bombers.



OPM Seeks Data On Scrap Segregation

Washington

OPM's iron and steel branch last week asked fabricators and manufacturers consuming 95 per cent of the current production of alloy steels to report on the extent to which their alloy scrap is segregated by types and grades from simple carbon steel scrap.

In a questionnaire directed to company purchasing agents, R. C. Allen, deputy chief in charge of raw materials, also sought information on the tonnage of each type of scrap produced during August, 1941; the facilities available for shearing, crushing, baling, washing, briquetting or otherwise preparing the scrap; and the names of the steel producers or scrap dealers to whom the scrap is disposed. The questionnaire included stainless steel scrap with other alloy steel scrap.

"The indicated demand for such alloying elements as nickel, chromium, molybdenum, etc., exceeds the current supply," Mr. Allen said in a letter accompanying the questionnaire. "While facilities

for the production of these alloying elements are being expanded, all possible sources of supply must be explored and developed."

OPM steel experts were represented as feeling that the vast amount of alloy scrap produced daily by industrial plants should, if properly segregated and identified, and returned in usable form, free from contamination, to the alloy steel producers, yield a large tonnage of these vital alloying elements. Aside from the factor of contributing to the defense program, some officials expressed the view that most plants will find definite operating economies because of the premium price obtainable for alloy content.

It was estimated that in some plants from 20 to 40 per cent of the alloy steel or alloy iron delivered by the producer or vendor is lost as scrap during conversion. In the production of some products the amount of scrap was estimated to be running as high as 70 to 80 per cent.

"The alloy content of such scrap is to a large extent reclaimable, but at the present time, a large part of this alloy content is being permanently lost because it is mixed with other steel or metal

scrap," OPM explained. "This is particularly true in the case of machine turnings or chips, flashings or chips, flashing from forgings, etc. Alloy losses in the case of bar ends, punchings, rejects and similar heavy melting scrap, while smaller, are relatively high."

Since many large manufacturers operate highly organized salvage departments and their operations have been found profitable, OPM experts point out that small manufacturers should experience little difficulty segregating and identifying heavy grades of alloy scrap such as rejects, punchings, and bar ends. Some problems may arise, however, in working out economical ways of segregating and storing light scrap such as borings, turnings, and chips, it was admitted.

By further educating machine tool operators, who in many plants keep non-ferrous metals separate from iron and steel, plants could insure the complete segregation of alloy steel scrap from simple carbon steels. Carrying this a step further, OPM suggested that such operators, knowing the composition of the parts on which they work, could segregate the alloy steel by types and grades.

Contracts with U.S. Discussed at Tool Dealers Convention

• • • "Doing Business With Washington" was the theme dominating the annual meeting of the Associated Machine Tool Dealers of America, held at Hot Springs, Va., Sept. 12 and 13. One of the most important reports presented at the executive closed session Saturday morning dealt with dealer-government body relationships. Earlier A. B. Einig, of the tools section of OPM, in an off-the-record talk explained how pooled orders of the Defense Plant Corp. worked and the part the dealer played in obtaining individual orders from defense contractors and subcontractors. Some of the problems facing sellers on DPC contracts was emphasized at one of the open sessions, and the problems of selling after the war was touched upon by another speaker. E. C. Brandt, Westinghouse Electric & Mfg. Co., gave an inspirational address at the dinner meeting.

In order for a dealer to have the funds necessary to meet the carrying of larger inventories and a greatly broadened accounts receivable, plus the free cash to meet greatly enlarged taxes, N. P. Lloyd, Lloyd & Arms, Inc., Philadelphia, advocated that by January, 1942, progress terms of payment should be required on all machine tool purchases. He suggested such terms should be three equal payments of 25 per cent of the face value of the contract, spread over the duration of the contract. The final 25 per cent he thought should be paid within 10 days after date of shipment. Anyone accepting contracts giving the right to the purchasers to cancel their contracts without such payments would be wholly at a disadvantage, Mr. Lloyd said.

Substantially all machine tool business today is directly or indirectly with the government, which is one of the worst offenders as far as delaying payment due to red tape is concerned. Mr. Lloyd labeled as "most notoriously unfair" those contracts for the 500-a-month bomber program, in which contractors avoid all responsibility by stating that they are merely acting for the Defense Plant Corp., without supplying any legal evi-

dence that they are acting for the DPC, nor are these orders signed by any person in behalf of the DPC, nor is there anything to show that there is an authority for a person to bind the DPC. It appears, Mr. Lloyd concluded, that you have no contract binding upon either the contractor, who is your purchaser, or upon the DPC. In addition, the purchaser definitely states that his obligation ceases with the recommendation to DPC that payment be made.

Perhaps the most dangerous stipulation in these DPC contracts is the one in which the purchaser has the right of "inspection and rejection" without the obligation of accepting replacement. In a pinch, the position of the distributor is very awkward because he has no recourse whatsoever against the purchaser nor against DPC. The right to cancel for failure to deliver on time is another dangerous stipulation, which should be omitted, Mr. Lloyd contended.

Since the trade is no longer confronted with industrial-commercial considerations of free enterprise as we have known them in the past, but are confronted with legalism, then the principle of possession being nine-tenths of the law is a good one to adopt. That is why Mr. Lloyd suggested the payment of 75 per cent of the value of the contract before the machine is delivered. In recent months, the speaker's firms has been selling machinery on the basis of 90 per cent of the purchase price payable within 10 days of shipment and the remaining 10 per cent within 30 days.

Dealers would like to buy the motors and controllers for the machine tools they sell (so as to take advantage of the regular dealers' resale discount) or if the machine tool builder insists upon selling the machine with all electric equipment included, then the dealer ought to be allowed his regular commission on this equipment as well as the machine proper, Dan Harrington, general manager, Wilson-Brown Co., New York, maintained. In discussing this controversial subject, he expressed the belief that if all the dealers representing a single machine tool builder would get together and agree on a plan of action, they could influence that builder in setting up his policy with respect to motors and electrical equipment so that the dealers would

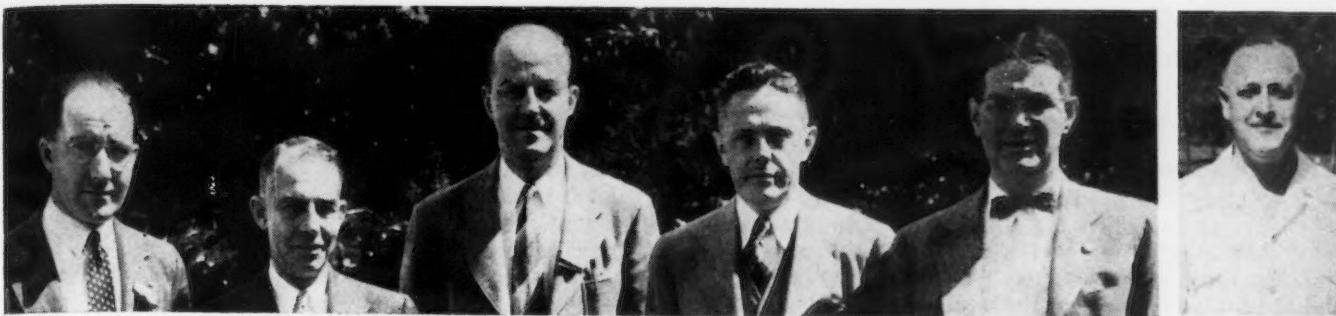
Tool Dealers Reelect F. B. Scott President

F. B. Scott, Jr., Syracuse Supply Co., was re-elected president of the Associated Machine Tool Dealers of America and Albert M. Stedfast, Stedfast & Rouletton, Inc., Boston, and now with OPM, was renamed first vice-president. L. H. Pratt, Henry Prentiss & Co., New York, was elected to the newly created office of second vice-president. George Zimmerman, Strong, Carlisle & Hammond Co., Cleveland, was named secretary-treasurer, and Thomas A. Fernley, Jr., remains as executive secretary. Several new members were elected to the board of directors for a term of three years: John M. Riordan, Riordan Machinery Co., Detroit; George E. Young, C. H. Gosiger Machinery Co., Dayton, and Robert Giebel, Jr., Giebel Machine Tool Corp., New York. George Habicht, Marshall & Huschart Machinery Co., Chicago, whose term expired this year, was re-elected to the board for a short term to fill the vacancy left by Mr. Pratt. John Sauer, Jr., Peninsular Machinery Co., Detroit, remains on the board ex-officio as most recent past president of the association.

at least get their regular commission. At present, some builders allow no commission at all on electrical equipment.

In his opening remarks, Mr. Harrington admitted that the manufacturers want to buy all the motors and electrical equipment for their machine tools because they get a nice discount from the motor manufacturer—in many cases from 3 to 10 per cent more than the dealer gets. The manufacturer feels that by ordering the electrical equipment, he can keep a closer check upon deliveries and be sure that the proper type of equipment is ordered; that he can follow up deliveries closer, and can get the necessary motor brackets and drives into the manufacturing processes sooner. He also likes to build up prestige with the motor manufacturer, often for reciprocity reasons.

Motor manufacturers, Mr. Harrington reported, prefer to deal directly with the machine tool builder, for many reasons—quicker service and quick transmission of instruction sheets, motor dimension sheets, etc., necessity of joint development



MACHINE TOOL Dealer Association executives at Hot Springs: From left to right. Thomas A. Fernley, Jr., executive secretary; Louis H. Pratt, second vice-president; Robert Giebel, director; Frederick B. Scott, Jr., president; Albert M. Stedfast, first vice-president, and George E. Young, director.

of the electrical features of the machine and the joint responsibility for the successful operation of this equipment. The credit angle is often important, particularly if the dealer has only a small office. The motor manufacturer does realize the dealers' place in the picture, however, by allowing a 17 per cent resale discount, but the fact that even larger discounts are about to be put into effect for machine tool builders is the best indication of how the motor manufacturers feel on this subject.

On his part, the dealer feels that the selling of motors and controllers is just as much a part of the sale of the machine tool as the machine itself, and will often cause the dealer more time and expense in getting motor details settled than the actual sale of the machine. Mr. Harrington believes that the dealer is entitled to the full motor commission which the motor manufacturers gives to the dealer, regardless of the circumstances of the sale.

Although none can foresee what post-war conditions the machine tool industry will have to face, all will agree that the distribution of machine tools will be a problem challenging the best thought and effort of all. How the industry might face these conditions was outlined in a message from Frederick V. Geier, president of the National Machine Tool Builders Association, and read in his absence by Tell Berna, general manager of the association. Mr. Geier believes it vital that both manufacturers and dealers alike join efforts to create new machine tool markets. For one thing, the post-war manufacturer who is endeavoring to redesign and retool his own product to recreate his own business will welcome the help of machine tool men whose seasoned knowledge of pro-

duction costs and results that can be obtained through the application of modern tools will be of the greatest benefit to machine tool using plants.

At a time like the present, when the volume of machine tool sales is so abnormal, some may feel that it is not necessary to develop the many sided service and selling methods that characterize the outstanding dealers and direct selling manufacturers. This will prove a shortsighted view, Mr. Geier is sure most will agree. "Let us look rather to the day when every resource of the dealers and the manufacturers will have to be bent to the task of recreating a machine tool market and of finding a way to maintain an active machine tool industry in a world which promises to be tragically overequipped with machine tools produced during a war emergency," Mr. Geier declared. It is a task not only for dealers and builders, but for the nation as well, because now through the national emergency, the vital character of the machine tool industry has at last received national and worldwide recognition. It is a task for humankind because this industry must be able to do its part to find the way to produce enough goods for all the people in the years to come, Mr. Geier's message concluded.

Declaring that we are now at war and that the United States must take the initiative as a world power whether we like it or not, Mr. Berna on his own part called for more initiative on the part of the machine tool industry too, although admitting that a concentration of national leadership in Washington is necessary at this time. He warned, however, that precedents in dealing with the government so easily established around the friendly desks of OPM officials will not be so friendly later.

A-3 Ratings Issued For Commercial Plane Upkeep

Washington

• • • Desiring to maintain commercial air transportation at its new high levels, OPM Director of Priorities Donald M. Nelson last week announced issuance of a defense rating of A-3 to deliveries of all materials of any nature which enter into upkeep of planes and ground equipment. It was stated that an air carrier or a supplier of maintenance equipment and repair parts wishing to obtain the assistance of the plan should apply to the Priorities Division on Form PD-96.

Each assignment of the rating will cover a three months' period, and the amounts and kinds of material so covered will be based on information furnished in the application. Provision is made for the immediate termination of the assignment of the rating if it is applied by an air carrier to deliveries in excess of the amounts specifically prescribed by the Priorities Division.

It was stated that a supplier may apply the rating only if the materials to be delivered cannot be procured without it. He is prohibited from using the rating to get deliveries in greater quantities or on earlier dates than are required for delivery on schedules of the rated material, or to obtain material which will not be used by his customer for the maintenance and repair of its aircraft and equipment.

The order may be extended by an air carrier by executing a copy and furnishing it to his supplier. A supplier may follow the same procedure where necessary to obtain deliveries from a sub-supplier.

Lack of Steel Holds Freight Car Output To 28% of Capacity

Pittsburgh

• • • Heavy demand from Naval and Maritime quarters for plates and shapes and a substantial number of priorities higher than the freight car rating of A-3 for these products, continues to keep freight car production at less than 50 per cent of capacity operations.

According to reliable sources, however, steel plate schedules for September are expected to reflect an increase in the volume of material to be shipped to car builders. This betterment in the supply of freight car material is expected to show up in October freight car construction, which may possibly turn out to be the best period of operations so far this year. Such expectations, however, are qualified, it is said, by the possibility of future Maritime and Naval in-

creased demand. The improvement which is expected to be made in deliveries to car builders will still leave freight car production at a rate somewhat less than that desired by the railroads and car builders.

It is estimated by some sources that freight car builders have a backlog of close to 70,000 freight cars. At the rate production is going at present this would represent about seven months' operations. However, strong efforts are being put forth by steel companies, the OPM and the freight car builders to step up the production of domestic freight cars. This is deemed especially necessary due to the tremendous program already laid out for 1942 and 1943, for which years a figure of 300,000 freight cars in the two-year period is being mentioned.

August production of domestic freight cars was at only 28 per cent of the Railway Car Institute's rated capacity (see accompanying table) and 38 per cent of practical capacity. However, this poor

showing was due in some part to labor disturbances at several car building plants. A reliable recheck, however, indicates that even allowing for the labor disturbances, August freight car production would have been no better than July when freight car builders operated at 39 per cent of rated capacity and 53 per cent of practical capacity.

Chief bottleneck in freight car production at the present time is the inability of car builders to obtain plates and structural shapes in the desired quantities. The situation today is hardly any different than existed early in July. (See THE IRON AGE, July 17, p. 83). There are definite signs, however, that September car production may show an increase since the OPM and the steel companies are straining every effort to allocate a greater portion of supplies to the nation's car builders.

Chief stumbling block continues to be the tremendous volume of plates and shapes needed for merchant ships and other higher rated projects, the production of which is mandatory upon the steel industry. The acceptance of bessemer steel car plates by many railroad car builders has alleviated the situation to some extent during the first two weeks of this month but interested parties still view the freight car building situation as one of the most serious problems in the national defense picture. Recent rumors that car builders as a whole were reluctant to pay freight on steel from distant points have, upon careful check, been found to be unsubstantiated by facts.

Freight Car Building Activity—August

Plant	Cars Produced	Monthly Car Capacity	Per Cent* Rated Capacity	Per Cent† Practical Capacity
<i>American Car & Foundry Co.</i>				
Berwick, Pa.	110	1,225	9	..
Huntington, W. Va.	0	550	0	..
Milton, Pa. (Tank Cars)	82	500	16.5	..
Chicago	82	400	20.5	..
Madison, Ill.	227	800	28.5	..
St. Louis	317	1,000	32	..
Total	818	4,775	17	33
<i>Pullman Standard Car Mfg. Co.</i>				
†Bessemer, Ala.	276	900	31	..
Butler, Pa.	13	1,200	1	..
†Michigan City	326	1,200	27	..
Hammond, Ind.	0	700	0	..
Total	615	4,000	15	21
<i>Pressed Steel Car Co., Pgh.</i>				
513	1,350	38	51	
<i>General Amer. Transportation Corp.</i>				
East Chicago, Ind.	618	1,000	62	..
Sharon (Tank Cars)	46	300	15	..
Total	664	1,300	51	55
<i>Greenville Steel Car Co., Greenville, Pa.</i>				
100	400	25	25	
<i>Bethlehem Steel Co., Johnstown, Pa.</i>				
599	800	75	100	
<i>Virginia Bridge Co., Roanoke, Va.</i>				
0	300	0	0	
<i>Ralston Steel Car Co., Columbus, Ohio</i>				
144	500	29	29	
<i>Mt. Vernon Car Co., Mt. Vernon, Ohio</i>				
225	350	64	45	
<i>Pacific Car & Fdry., Seattle, Wash.</i>				
207	250	83	83	

Production and capacity data above do not include car building shops owned by several major railroads.

*Based on a total capacity of 14,000 cars a month as reported by the Railway Car Institute.

†Based on private estimate of 10,300 cars a month total capacity.

‡Labor disturbances were responsible for part of the decline in August. However, allowing for this factor, it is indicated that generally production was no better than in July.

Domestic Freight Car Production

(Per Cent of Capacity Operated By Car Building Plants)

	Cars Produced	% of Capacity— Rated* Practical†
January	5,009	36 49
February	4,122	29 40
March	5,022	36 49
April	5,563	40 54
May	5,086	36 49
June	5,143	41 50
July	5,491	39 53
August	3,886‡	28 38
Total (8 Months)	39,322	35 48

Lag in Carbuilding Brings New Plea for Quicker Unloading

Washington

• • • Declaring that scarcity of materials will result in 20,000 less new cars being in service on Oct. 1 than had been expected, Defense Transportation Commissioner Ralph Budd last Thursday addressed a letter to all of the nation's shippers and receivers urging full cooperation in efficient utilization of existing equipment to make up for the lag in the carbuilding program. The letter said that during the next several weeks in order that every one desiring transportation service may receive it currently without delay, new records in the volume of transportation rendered per unit of serviceable equipment must be made.

It was stated that if carloadings follow the usual pattern in rising to the fall peak, and especially in view of the diversion of freight from other carriers to the rails, then the highest weekly loading may be between 975,000 and 1,000,000 cars. On Aug. 15, 1941, the letter said, there were 1,589,203 railroad-owned serviceable freight cars, an increase of 163,383 over

the number available on Sept. 1, 1939. It was added, however, that inability to obtain the necessary materials will result in the 20,000-car shortage on Oct. 1.

"A few hours and a few dollars spent in loading or unloading cars seven days a week or after usual closing time may well pay large dividends to the shippers directly involved and to the country as a whole," Mr. Budd declared.

Letters were addressed to A. W. Vogtle, Birmingham, Ala., president of the National Association of Advisory Boards, and J. E. Bryan, Chicago, president of the National Industrial Traffic League for distribution to their membership, representing 85 to 90 per cent of the total railroad tonnage.

Knudsen Reshuffles OPM Industrial Branches

Washington

• • • Prompted by the establishment of a new OPM division of civilian supply, Director General William S. Knudsen has reshuffled 28 industrial branches, assigning them among OPM's divisions of production, purchases, civilian supply and materials.

Leon Henderson, who as OPACS administrator clashed for several weeks with OPM over the extent

of automobile production curtailment, has been given jurisdiction over OPM's automotive and transportation equipment branch formerly headed by James A. Adams. Mr. Adams resigned recently to return to the Colgate-Palmolive-Peet Co., of which he is president.

By virtue of his appointment as director of the new OPM division of civilian supply, Mr. Henderson also takes seven other industrial groups under his wing as a result of the assignments made by Mr. Knudsen. Included among these are the lumber and building materials branch; plumbing and heating branch; electrical products and consumers durable goods branch; industrial machinery branch; and the rubber and rubber products branch.

The new line-up under the other three OPM divisions follows:

DIVISION OF PRODUCTION—W. H. Harrison, director—aircraft branch; ordnance branch; tools branch; shipbuilding branch; construction branch. OPM said these units will assume primary responsibility for dealing with problems affecting the manufacture of implements of war and defense construction projects.

DIVISION OF PURCHASES, Douglas C. MacKeachie, director—food supply branch; textiles, clothing and equipage branch; health supplies and civilian defense equipment branch; containers branch. Their job is to deal with industries in which defense procurement of finished products is a major problem.

DIVISION OF MATERIALS, W. L. Batt, director—aluminum and magnesium branch; chemical branch; iron and steel branch; power branch; nickel branch; tungsten branch; copper and zinc branch; manganese and chromium branch; tin and lead branch; mica and graphite branch; miscellaneous minerals branch. These sub-divisions have been given primary responsibility for dealing with the manufacture and importation of industrial and raw materials and industrial services essential to defense.

Mr. Knudsen reported that no industrial divisions are contemplated for the division of priorities, headed by Donald M. Nelson, the division of labor, or the newly-created division of contract distribution.

U. S. TRUCKS FOR THE MIDDLE EAST: Among the many shiploads of war material reaching British and Allied forces in the Middle East are large consignments of trucks and cars. Crates landed on the quayside (above) contain American trucks and cars which arrive in parts and are assembled on the spot.



Nelson Orders Long Range Study of U. S. Arms, Civilian Needs

Washington

• • • The new Supply Priorities and Allocations Board last week ordered its staff to draw up long-range schedules of both military and civilian requirements as Director of Priorities Donald M. Nelson sought additional enforcement teeth for all priority rules and regulations.

After 15 months of defense effort, the super planning agency admitted that accurate, coordinated knowledge of actual military and civilian needs is still a missing link in the defense picture. Described as an attack against the twin problems of shortages of essential materials and expansion of productive facilities, the move calls for a detailed outline of both civilian and military needs and a breakdown into raw material, labor and machinery classifications.

SPAB took the position that incomplete returns compiled by individual agencies are valueless and that any long-range, all-inclusive survey of total requirements should be developed by one authority.

Specifically, Mr. Nelson sought to clothe all priority rules and

regulations with new legal power by making all preference ratings mandatory, by declaring valid all preference rating certificates bearing issued under the name of E. R. Stettinius, Jr., former director of priorities, and by requiring the stamping of preference ratings on application blanks in order to avoid delays in securing complete preference rating certificates.

Preference ratings issued for civilian contracts, for foreign government contracts and for other United States government contracts heretofore have been based upon the voluntary cooperation of the persons concerned. Under Mr. Nelson's order all priority actions will be mandatory, a development which, officials said, will be of assistance to many producers who in the past have been confronted with serious scheduling difficulties because of both mandatory and voluntary ratings on their order books.

Because a number of preference rating certificates issued when Mr. Stettinius was director of priorities are still in operation, and because a large number of certificates signed in blank by him for Army and Navy field officers are still available, the priorities division found it necessary to declare specifically that, during the transition period, certificates signed by Mr. Stettinius continue to be valid.

The requirement for stamping

preference ratings on application blanks was designed to facilitate the rapid handling of delayed applications, which in recent weeks have been received at the rate of 4000 a week. The new system works this way:

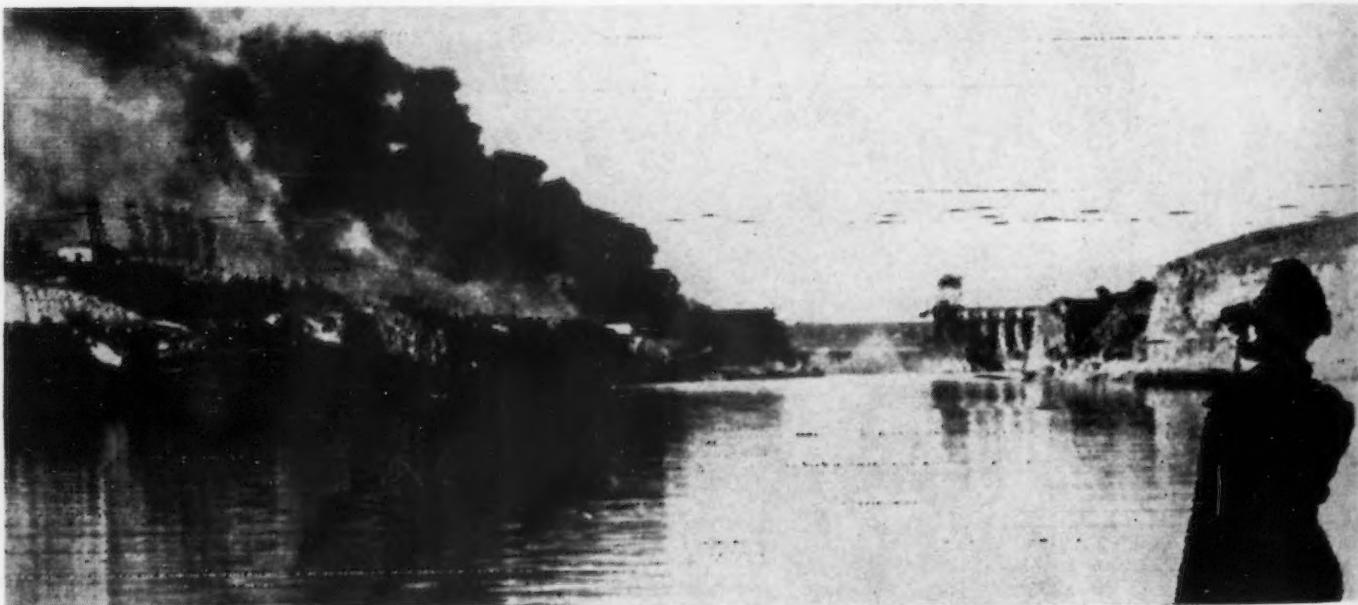
Instead of processing each application as usual, and preparing individual preference rating certificates which require a lot of paper work, a preference rating—if one is to be granted—will be stamped on the face of the application itself. The blank will then be returned to the applicant, who can use it just as he ordinarily would use a preference rating certificate. The use of this plan, according to Mr. Nelson, already has resulted in cleaning up thousands of pending applications in the last two weeks.

D. B. Colyer Here as Aid to Canadian Steel Controller

Toronto

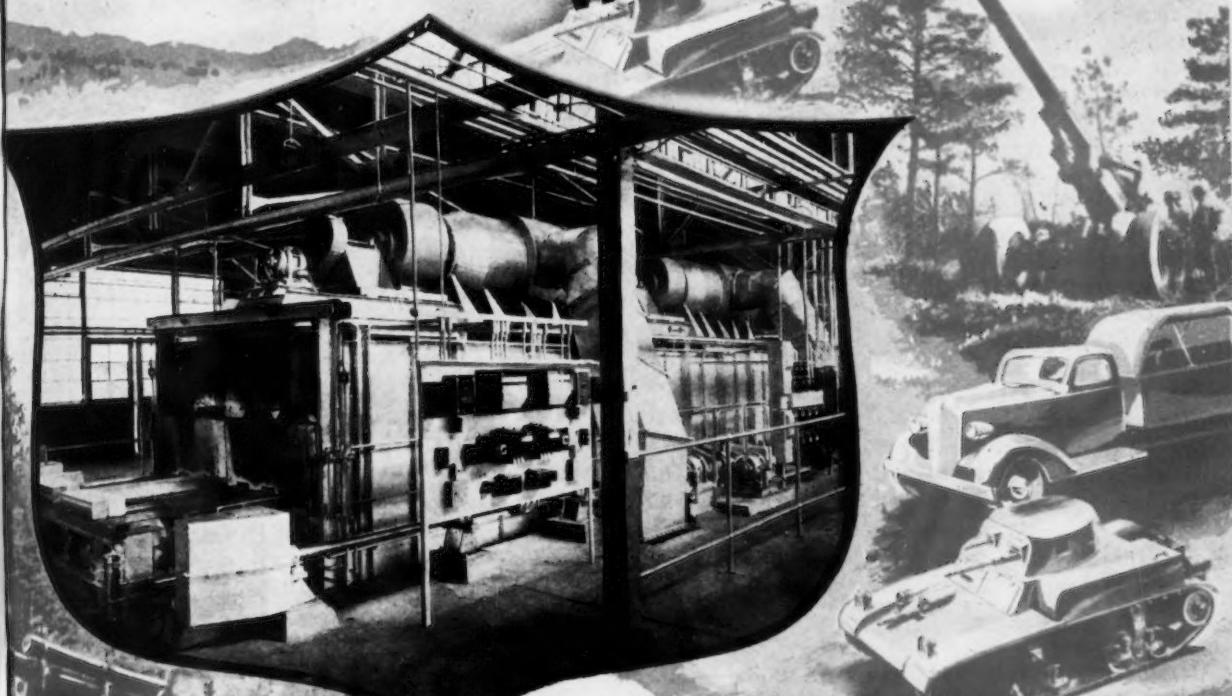
• • • D. B. Colyer, of Winnipeg, has been sent to the United States as special representative of F. B. Kilbourn, Canadian Steel Controller, C. D. Howe, Minister of Munitions and Supply, has announced. Mr. Colyer's duties at Washington will be to cooperate with United States authorities in respect to Canadian steel requirements.

SOVIET DAM DESTROYED: Confirming the Russian claim that the great Dnieperstroy dam which supplied power over much of the Ukraine's industrial section was blown up by the Soviet armies, the German censor has released the above photo. Burning industrial plants are shown in the background. The dam was American-built.



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O'Mahoney Has Plan To Ease Effects of Material Shortages

Washington

Sen. Joseph C. O'Mahoney, who as chairman of the now-defunct TNEC worried about the plight of small business in the pre-defense era, is willing to become the Senate champion of small enterprise in the face of material shortages created by the priorities system. He prescribes two remedies, one of which is to tap the undeveloped mineral resources in the West. The other calls for revision of the existing priorities policy, permitting the President over the head of the OPM priorities division to allocate material to civilian manufacturers to ward off substantial hardship, prevent unemployment and protect the interest of the consumer.

As chairman of a special Senate committee named to explore the more effective development and use of natural resources for defense, the Senator maintains that the new OPM division headed by Floyd B. Odlum assures a more equitable distribution of contracts, but that the closing of plants because of curtailed material supplies results from the raw material situation.

"It is idle, for example, to talk of a shortage of steel so long as

the West has enormous deposits of untouched iron ore," Senator O'Mahoney said after completing public hearings in Colorado, Wyoming and Utah. "Since pioneer days the people of Wyoming have known of Iron Mountain which, within 50 miles of the State Capitol, is an actual tower of iron remaining undeveloped—ten million tons of it."

"In Utah there are great deposits of alunite, a raw material out of which aluminum can be made. There are hundreds of square miles of coal and petroleum stores in the West, as well as quantities of magnesite, antimony, lead, copper and many other essential minerals."

His proposal to ease the impact of priorities upon small business is embodied in a bill identified as S-1847. Briefly, the measure would permit any person adversely affected by the priorities program, to petition an agency to be designated by the President. After hearings, if it could be established that as a result of such priority his business was about to be seriously interfered with, or substantially curtailed because of a material shortage, the agency would then report to the President who, the bill provides, "shall allocate to such person such amounts of the material with respect to which the shortage exists as in his judgment will be necessary to prevent substantial hardship to such per-

son, his employees, or consumers."

The Senator called attention to his pending bill after the White House reorganized the OPM's defense contract service, creating the new division under Mr. Odlum. Warning his Senate colleagues that the country is "being threatened with a new unemployment problem," the former chairman of the Temporary National Economic Committee called the OPM reorganization "a very important step forward in the protection of the interests of small business," but added that the proposed new allocation of defense orders is not enough.

He read into the record three letters from business interests in Toledo, West Palm Beach, Fla., and New York City, indicating that they were typical of the response coming to him from "all over the country" with respect to his pending bill. The Senator attempted to link his measure with the President's Executive Order creating the new OPM division of defense contracts by asking unanimous consent that both documents be printed for the record.

Demand for More Huletts Seen If Ore Fleet Expands

Cleveland

• • • It is reported that at least five, and perhaps as many as seven, new Huletts, giant ore unloading machines, may be built at various Lake points, if present plans to increase the number of ore-carrying ships are consummated. Since there are only 53 Huletts now operating in the United States, this would make a sizable addition to the number in use, especially in view of the fact only one new Hulett has been built since 1929.

If and when, the new Huletts are constructed, three of them probably will be erected at Chicago, and two at Lorain, Ohio. Moreover, it is also possible that two more may be built at Cleveland for Republic Steel. At present several of the unloaders in operation are being repaired and overhauled.

The Wellman Engineering Co., Cleveland, is the sole maker of Hulett machines, which are large enough in some cases to take a 17-ton bite of ore out of the holds of ore carriers.

HOW THE DOLLAR DROPS: In July, 1920, the U. S. dollar would buy what only 50c. would have purchased just before hostilities began in 1914. Price ceilings may help prevent the decline in the dollar's purchasing value but, industry notes, the government shies away from putting a ceiling over wages.



HOW THIS LEBANON SYMBOL

Meets Defense



Specifications

AT CRITICAL POINTS along America's industrial front line, Lebanon Circle **L** Steel Castings meet the most exacting demands of the emergency. Used directly in military equipment and used in machines that create the sinews of defense, Circle **L** Castings play vital and versatile roles. The table below shows how they meet Federal, S.A.E. and A.S.T.M. specifications.

LEBANON DESIGNATION	GOVERNMENT SPECIFICATIONS	S. A. E. ANALYSIS SPECIFICATIONS	A. S. T. M. SPECIFICATIONS
L	QQ-S-681a Class 0	1030	A-27-39 GR.-A-2
L	Class 1	1020	A-215-39T GR.-A-2-W
L	Class 2	1025	A-27-39 GR.-B
L 1	Class 3	X1030	A-148-36 CL.-B GR.-2
L 2	Class 4	X4130	A-148-37 CL.-B GR.-3 CL.-C GR.-2
L 3	Class 4	4140	A-148-36 CL.-C GR.-3
L	Navy Dept. 4951 J&K Class B	1020	A-215-39T GR.-A-2-W
L	Class D	1025	A-27-39 GR.-B
L 1	Class A	X1030	A-148-36 CL.-B GR.-2
L 1	Class F	X1030	A-148-36 CL.-B GR.-2
L	Class C	1025	A-27-39 GR.-N-2
L 9	Navy Dept. 46533		A157-40 GR.-C1
L 22 L 21 L 22 M	Navy Dept. 46S27a Grade 1 Grade 1 Weld Grade 7	30905 30705 30615	A157-40 C9a
L 1 Mod.	R1XS192	X2030	
L HCA #2 L HCA #3	Ordnance Dept. U.S. Army AXS492 AXS493	Cast Steel Armor	

All Government specifications are for cast steel.
The Society of Automotive Engineers (S. A. E.) specifications cover rolled steel, but are the approximate corresponding chemical analyses.
The American Society for Testing Materials (A. S. T. M.) specifications are all cast steel specifications.

LEBANON Stainless and Special Alloy STEEL CASTINGS

THE IRON AGE, September 18, 1941—109

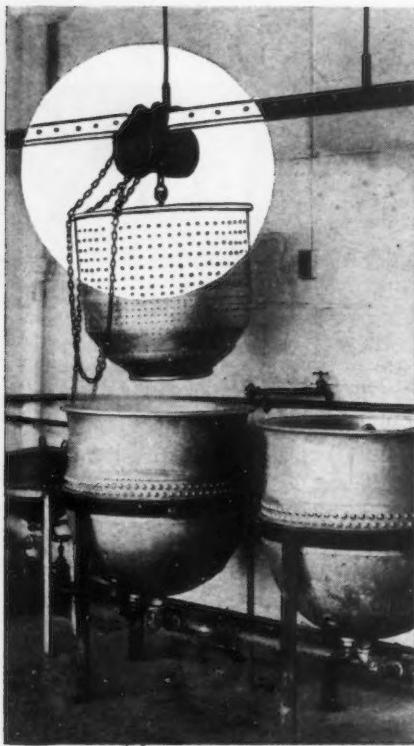
The table shown is from the Lebanon Reference Chart listing comparable classifications of U. S. Government, S. A. E. and A.S.T.M. for Circle **L** Steels. The complete chart . . . which includes analysis and physical properties as well as specifications . . . is available to executives, engineers and metallurgists upon request.

LEBANON STEEL FOUNDRY
503 Lehman St., Lebanon, Pa.

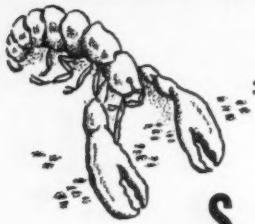
ORIGINAL AMERICAN LICENSEE
GEORGE FISCHER (SWISS CHAMOITE) METHOD



NEWS OF INDUSTRY



HOT AND HEAVY HANDLING PROBLEM



SOLVED by this cannery in the simple, practical way shown. An automatic conveyor fills seafood cookers and carries them to the cooking units. The steaming hot cookers are then quickly removed to the packing department—all without the danger of scalding workers. (And you should have seen how compensation insurance premiums went down!)

As extra benefits, the company gained faster handling and extra floor space. Total cost was well under \$150.00, repaid several times over in one short season.

We believe in doing it the simplest, and most practical way that will bring results. That's the basis on which we would like to discuss your materials handling problems.

READING CHAIN & BLOCK CORP.
DEPT. 210
READING, PA.

READING
Chain Hoists, Electric Hoists,
Cranes and Monorails

New Contest Will Center on Design for Highway Bridge

• • • Another annual bridge design contest has been announced by the American Institute of Steel Construction, 101 Park Avenue, New York. Open to bona fide registered students of structural engineering and architecture in recognized technical schools of the United States and its possessions, the competition offers three cash prizes of \$200, \$100 and \$50 respectively for first, second and third places. Certificates will be awarded prize winners and those given honorable mention. The subject of the competitive design is a steel highway bridge. The deadline on drawings is Feb. 10, 1942.

Crucible Metallurgists Give Molybdenum Lectures

• • • In cooperation with local chapters of the American Society of Metals, requested by the OPM to conduct meetings devoted to the proper handling of Molybdenum high speed steels, metallurgists of the Crucible Steel Co. have delivered several lectures on that subject with more to follow in the next two months. Lectures have been given to ASM chapters in Chicago, Indianapolis, St. Louis and Syracuse with later meetings scheduled for Providence, New York, Pittsburgh and Toronto.

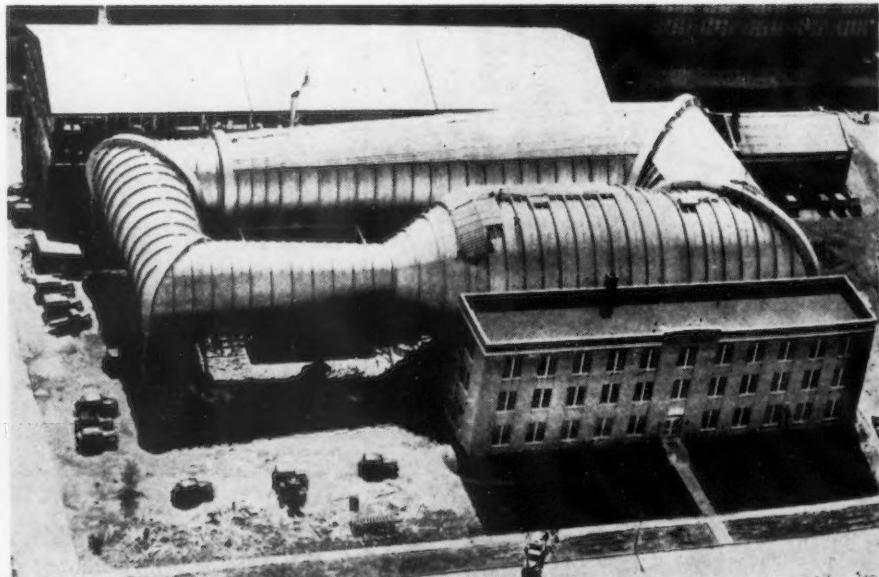
Papers on Gear Tooth Design Planned for AGMA Meeting

• • • Separate simultaneous sessions devoted to gear technology and to commercial problems are planned at the 24th semi-annual meeting of the American Gear Manufacturers Association, to be held at the Edgewater Beach Hotel, Chicago, Oct. 20, 21 and 22.

The technical program will include two papers by A. H. Candee, gear engineer of the Gleason Works, one on "Calculated Bending Strength in Spur Gear Teeth," and the other, "Geometrical Determination of Tooth Form Factor." Other technical papers will be "A Photoelastic Study of the Stresses in Gear Tooth Fillets," by Professors Dolan and Broghamer of the University of Illinois, and a paper by H. A. McConville of the General Electric Co., on "E.P. Lubricants." Two additional papers touching upon gear tooth stresses and wear are contemplated.

Reports from committees will bring forth the latest developments tending toward standardization in lubrication, materials and noise, with special emphasis on gear tooth wear. N. C. Goin, Westinghouse Electric & Mfg. Co., is chairman of the program committee. W. P. Schmitter, Falk Corp., will open the meeting as president of the association.

TUNNEL FOR PLANE TESTS: This is a new wind tunnel recently completed at Langley Field, Va.



AN *Alternate* CAN HAVE
ATTRACTIOnS OF ITS OWN . . .



Forced to seek an acceptable substitute for aluminum parts and others tied up by defense needs, countless manufacturers have turned to pressed steel as the best "alternate." Transue, with its extensive design and production facilities, has been able not only to supply the necessary stampings to such firms but, in many cases, has circumvented obstacles which seemed to prevent the adoption of the new material. Contrary to general expectations, the "alternate" has often provided advantages never before obtained. Perhaps you, too, can find the solution to your problems in Transue's successful experience with deep drawn stampings.



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ALLIANCE • OHIO
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SALES OFFICES: NEW YORK, PHILADELPHIA,
CHICAGO, DETROIT, INDIANAPOLIS, CLEVELAND

**Construction Awards Again
Top 1/2-Billion Dollar Mark**

• • • Construction engineering awards during August, according to reports from **Engineering News-Record**, totalled \$529,561,000, topping the half-billion dollar mark for the third consecutive month. This volume brings the 1941 construction to \$4,329,627,000, a 103 per cent increase over the total for the same eight-month period of 1940. Public construction, ac-

counting for \$456,579,000 of the total, is 129 per cent over the volume for the first eight months of last year due chiefly to the sharp increase in federal construction.

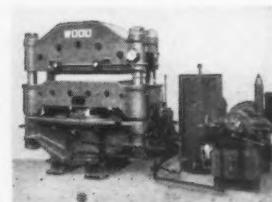
New construction financing for the year to date, totalling \$5,403,461,000, consists of private investments of \$627,462,000, federal appropriations for non-federal work of \$378,410,000, and \$4,397,589,000 is in federal funds for federal construction.



NOTE IT FOR CAPACITY

THE
Hele-Shaw
Fluid Power Pump

Hele-Shaw Pump with Type F regulator. This is one of the many types of automatic Hele-Shaw regulators.



R. D. Wood 500-ton leather embossing press with 22" main ram. Powered by a Hele-Shaw Pump with a Type F Control and locking Type B Control.

OTHER A-E-CO PRODUCTS: LO-HED HOISTS, TAYLOR STOKERS, MARINE DECK AUXILIARIES



AMERICAN ENGINEERING COMPANY

2410 ARAMINGO AVENUE, PHILADELPHIA, PA.

**Small Cases Annoy
Mediation Board,
Conciliator Says**

Minneapolis

• • • Production on \$1,600,000 worth of defense orders for large motors and generating equipment was held up last week by a strike called at the plant of Electrical Machinery Mfg. Co. here, by the United Electrical, Radio & Machinery Workers' Union (CIO). The 350 employees of the company went on strike after wage demands had been refused and mediation efforts of a Department of Labor conciliator had broken down. Frank Wenig, the conciliator, said the National Defense Mediation Board will not be asked to intervene, as it is "becoming annoyed at the number of comparatively small differences it is asked to settle."

**Armco Scrap Drive Nets
Good Will, Material**

Middletown, Ohio

• • • The psychological effect of recent scrap drives is reported by officials of the American Rolling Mill Co. to have more than justified the drive, while the incidental fact that a fairly substantial amount of scrap was also obtained was cause for some rejoicing. Officials indicate that a stimulation of public interest in the steel mill needs, as well as the arousing of active employee co-operation, in seeing that material is obtained, has continued even after the close of the drive.

**Kennametal Output
To Be Doubled Again**

• • • Notwithstanding a 500 per cent increase in the production of Kennametal during the past 12 months, production will be doubled again by December of this year, according to Philip M. McKenna, head of McKenna Metals Co., Latrobe, Pa. "Delivery dates of ten days to two weeks are being made on orders for single point standard or modified standard designs of Kennametal tools used widely in machining steel shell forgings, cast steel tank parts and hard alloy steel airplane parts," Mr. McKenna reports.



Photo by Harris & Ewing

HENDERSON'S BACK AGAINST A WALL: The above photograph shows the Price Administrator in an unusual position. But it's only for exercise. He touches a wall with his back 100 times each morning to keep fit.

Navy "E" to Mesta

Pittsburgh

• • • At a ceremony last week at the plant of Mesta Machine Co., Rear Admiral W. T. Cluverius presented the coveted Bureau of Ordnance flag of the Navy "E" pennant, to the company and its employees.

Admiral Cluverius said the Mesta Machine Co. "is the winner of a unique race—a race for guns, for ship turrets, and for other materials of war that will make this nation's navy the best on the high seas. This company has turned over all its facilities for the navy and the army. The employees and officers of the company are keeping a day ahead of their schedule."

Admiral Cluverius explained that the Navy "E" pennant is an emblem of "excellence and efficiency" and presented the ordnance flag and the pennant to L. W. Mesta, vice-president of the company.

Use in Gun Clips Tightens Supply of Cold Rolled Strip

Cleveland

• • • Cold rolled strip steel has grown increasingly tight during recent months as a result of the rising demand for this product for use in stamping machine gun clips. Consumers with A-10 or lower priority ratings are, in some instances, not getting shipments.

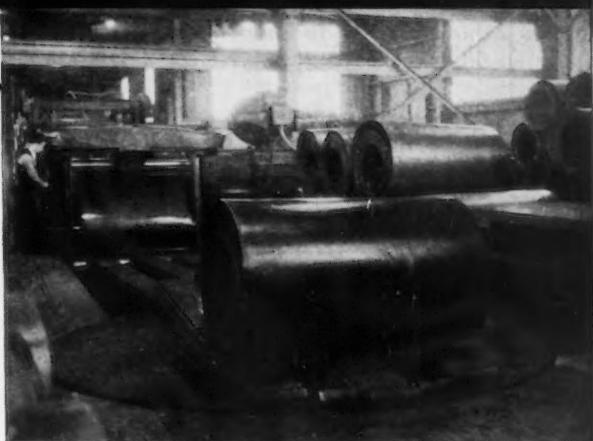
The War Department has been using sizable tonnages of strip ranging from 1.58 in. to over 3 in. in width for this purpose. It is reported that Firestone Tire & Rubber Co., at Akron, recently estimated that their uses of strip for this purpose would approximate 20,000 tons. Moreover, the War Department is still seeking subcontractors to stamp out additional quantities of these clips.

Avoid CONFUSION



IN *handling*

● Confusion means waste—waste in worker-energy, waste in time, waste in material. Mathews can help you eliminate confusion in handling materials through production. Why not call in a trained Mathews Field Engineer this week.



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Field Engineers and Sales Offices located in 30 Industrial Centers.

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saving . . .
high as
30%**



AVIATION manufacturing speed-up without sacrifice of precision. For proper rolling contact of gear teeth in these magneto mounting drive gears, the correct backlash is maintained by Laminum shim. Simply peels for adjustment. Saves 30% and more in factory assembly or servicing time. Accuracy otherwise possible only by tedious, expensive methods! • Shims (.002 or .003 in. thick laminations) cut to your order. Stock shim materials for repair and maintenance obtainable from mill supply dealers.

Laminated Shim Company
INCORPORATED

76 Union St. Glenbrook, Conn.

Write for file-folder of shim application photos—and Laminum sample.

LAMINUM
THE SOLID SHIM THAT *peels* FOR
ADJUSTMENT
1668

114—THE IRON AGE, September 18, 1941

NEWS OF INDUSTRY

DPC Will Finance Two More Magnesium Plants

Washington

• • • Two more magnesium plants costing \$68,000,000 and a \$3,900,000 aluminum plant will be under construction shortly as a result of agreements made with the Defense Plant Corp., RFC subsidiary.

One of the magnesium plants, with an annual capacity of 36,000,000 lb. of metallic magnesium, will be built by the Diamond Alkali Corp. of New York at Painesville, Ohio. To be operated by the same company, the facilities will cost \$16,000,000. The other plant, to have an annual capacity of 72,000,000 lb. will cost \$52,000,000. It will be constructed and operated by Dow Chemical Co., on the Gulf near Freeport, Tex.

Both will be owned by DPC, will operate for its account, and use the Dow electrolytic magnesium chloride process.

The aluminum plant will be constructed in the vicinity of Tacoma, Wash., by the Olin Corp., of Alton, Ill. It will cost \$3,900,000 and have an annual capacity of about 30,000,000 lb. of aluminum. The Olin company will operate the facilities for the account of DPC, the title holder.

DPC recently contracted with Basic Magnesium, Inc., for the construction and operation of a 112,-

Ferroalloy Prices Set for Quarter

• • • Domestic ferromanganese prices have been reaffirmed for fourth quarter shipments at \$120 per gross ton, carloads, f.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

High and low ferrochrome prices have been raised for fourth quarter delivery. The increase will be 2c. per lb. of contained Cr, delivered carloads, lump size, on contract, which will result in 4 to 6 per cent carbon becoming 13c. instead of the present 11c. price. Chrome briquets will be up 1½c.

Electric furnace ferrosilicon prices will be unchanged for fourth quarter.

000,000-lb. magnesium plant in Nevada. The Dow Chemical Co., which owns and operates magnesium producing facilities at Midland, Mich., is also operating the Freeport, Texas, plant which is financed in part by the company and partly by the British. The company also is completing another plant near Freeport.

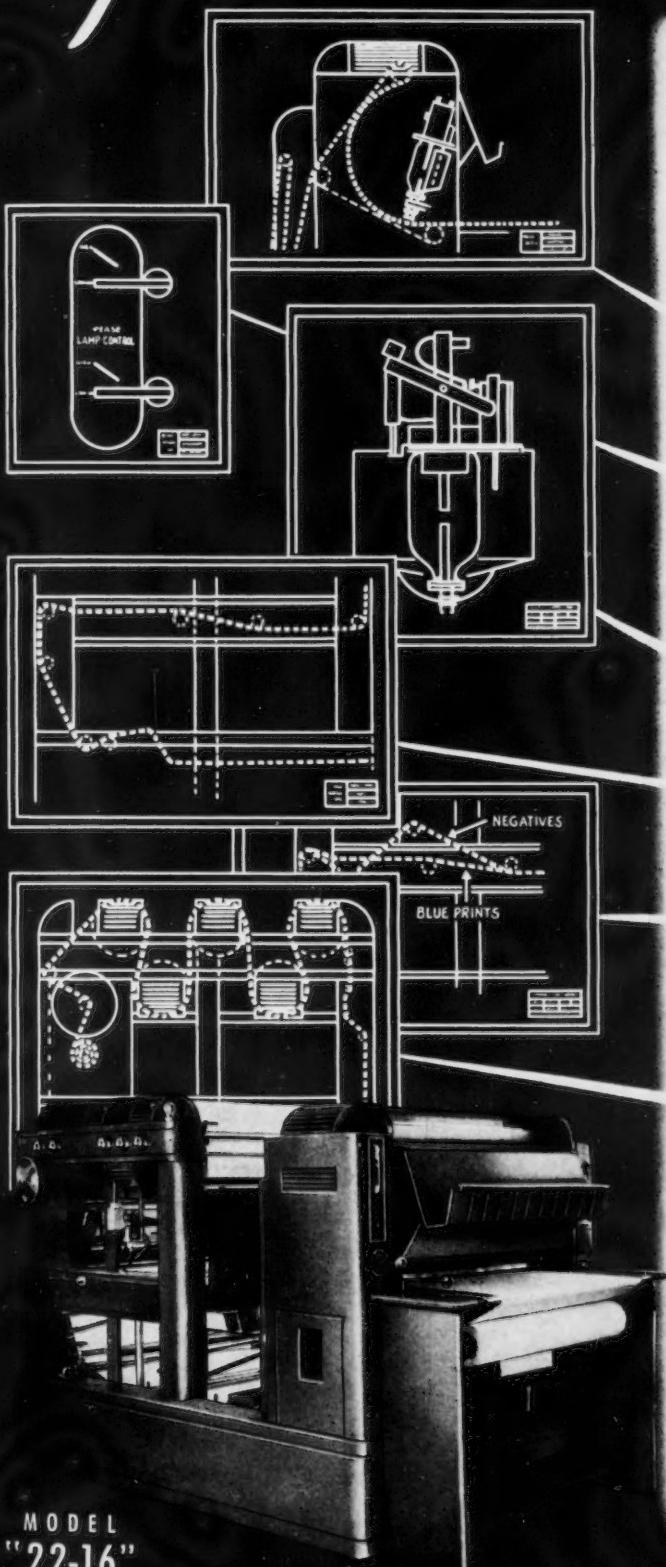
The total output of all magnesium plants under construction and operating will be 274,000,000 lb. of metallic magnesium a year. RFC said negotiations are under consideration for additional capacity by other manufacturers.

MORE SHIPS: Britain is constantly increasing its building of ships despite a decline in Atlantic sinkings. Here plates for a new ship are being drilled in a British yard.

Photo by British Combine



Good BLUEPRINTS



MODEL
"22-16"

Pease Blueprinting Machines

A TYPE AND SIZE FOR EVERY REQUIREMENT INCLUDING DIRECT PROCESS PRINTING

ARE AT THEIR VERY BEST
WHEN MADE ON PEASE
BLUEPRINTING MACHINES

Because ONLY PEASE HAVE

★ Sliding "Vacuum-Like" Contact which smoothes out tracing inequalities . . . gives 24 $\frac{3}{4}$ " uninterrupted exposure area, more than is possible with a 12" cylinder . . . and, for example, prevents printing a "3" as a "9," etc.

★ Three Speed Lamp Control which allows the lamps to be operated at 10, 15 or 20 amperes, doing away with running speed and dryer heat changes . . . The mechanical operating speed remains the same and the lamp amperage varies according to the tracing being reproduced.

★ Actinic "No-Break" Arc Lamps, four in the 42" and five in the 54" model, which give unequalled uniformity of light emission . . . burn for 45 minutes without a break and resume instantaneously.

★ Horizontal Water Wash which floats the exposed paper horizontally free from tension, thus preventing wrinkles and eliminating stained prints and virtually all bleeding. Tanks are of rust resistant copper.

★ Quick Change Chemical Applicator System which allows change from Blueprints to Negatives or vice versa, in 30 seconds, and provides the only method of applying potash to one side and hypo to both sides of paper, thus eliminating yellow stains. Very economical.

★ Aluminum Drying Drums, five 8" diameter drums thermostatically controlled, heated either by gas or electricity, which allow gradual drying, automatically and without distortion, resulting in "prints as flat as hung wallpaper."

Model "22-16" is made in 42" and 54" sizes; write for descriptive literature. Pamphlets on lower capacity Pease Blueprinting Equipment will also be sent upon request. No obligation.

THE C. F. PEASE COMPANY
2695 WEST IRVING PARK ROAD
CHICAGO • ILLINOIS

NEWS OF INDUSTRY

Ratings Issued for Welding Equipment

Washington

• • • An A-1-c preference rating for manufacturers of arc welding and resistance welding equipment, to assure the acquisition of eight classifications of materials, has been issued by the OPM priorities

division. Officials said the high defense rating assigned is applicable only to materials entering into the production of equipment to fill a defense order.

Materials to which the A-1-c rating is applicable include forgings and castings, ferrous and non-ferrous; sheets, bars, rods, plates, and wire, ferrous and non-

*The FIRST
CUTTING
COMPOUND*
*Developed Especially
for
CARBIDE
and other
VERY HIGH SPEED
CUTTING TOOLS*

THE rapidly increasing use of carbide and other high speed tools emphasizes the immediate importance of this original type of cutting fluid. STUART'S SOLVOL Liquid Cutting Compound was developed especially for this exact condition. Where operations run "too hot" for properly applied straight cutting oils — and where ordinary soluble cutting oils or soluble paste compounds fail to produce satisfactory finish or tool life — that's the place for this original Stuart Oil development.

WIRE TODAY for working sample — FREE to any industrial concern working on defense orders. To assure proper application please tell us name of part, stock, machine and cutting operations.

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Chicago, U.S.A. • LIMITED • Est. 1865
Warehouses in All Principal Metal Working Centers



Navy Acts to Spread Defense Contracts

Washington

• • • The Navy Department took steps this week to spread naval defense contracts in line with President Roosevelt's recent order to help communities whose industries are threatened by shutdowns or dislocations.

Acting Navy Secretary James Forrestal announced that groups of special reserve officers experienced in production, whose job is to assist OPM's new division of contract distribution, have been appointed to each of the continental Naval districts.

Promising to use the services of plants which otherwise would face shutdown, the Navy said that the practice of "farming out" defense orders would be "pushed to an increasing pace with consequent benefit to smaller industries." Additional Naval officers will be assigned to Floyd B. Odlum, OPM director of contract distribution, as may be required and as circumstances will permit, Mr. Forrestal said.

ferrous; insulation materials; motors and other electrical accessories; gasoline and diesel engines and accessories; machine parts and accessories; brass, copper and steel tubing and fittings; and maintenance and shop supplies.

Under the terms of the order, the preference rating may be used by the manufacturer, and if necessary, by his supplier, by execution of additional copies of the order. The supplier, however, may only obtain materials on the list which are to be physically incorporated in the arc welding or resistance welding equipment.

60 to 80% of Fan Groups' Output Goes for Defense

• • • From 60 to 80 per cent of the products manufactured by member companies of the National Association of Fan Manufacturers, whose next meeting will be held in New York on Dec. 4, are now being furnished for defense projects, the association reports. The application of fans and blowers for these purposes range from small ventilating blowers to protect individual welders to huge blowers handling 100,000 cu. ft. of air per min. for testing of airplanes.

AUTOMATIC

MARK

Electric Propelled INDUSTRIAL TRUCKS



AIDING INDUSTRY TO BUILD AMERICA'S
BULWARK OF DEFENSE

For the all important job of American Industry today, "AUTOMATIC" Materials Handling Systems are being enlisted to the fullest extent, in the transportation—storing—stacking and loading of vital materials . . . tons of it . . . raw and finished — speedily — systematically — economically — safely.

To meet this ever increasing production demand for equipping new plants—expanding or improving existing facilities—"AUTOMATIC" is pledged to "ALL-OUT" aid by supplying Electric Propelled Industrial Trucks of every description and capacity . . . Yes! With ever increasing intensity its entire organization and facilities are being employed to accomplish the task of producing as rapidly as possible, the finest Materials Handling Equipment the industry has ever known.

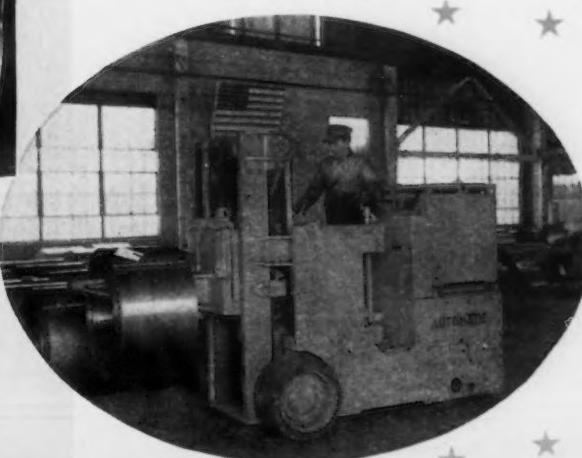
So to users . . . old and new . . . large and small, "AUTOMATIC" eagerly and sincerely desires to be ever helpful to every industry in the planning of today's materials handling systems designed for future efficiency when normal production once again returns. Write for the nearest "AUTOMATIC" Representative to call and discuss your problem.

AUTOMATIC TRANSPORTATION COMPANY

Division of the Yale & Towne Mfg. Co.

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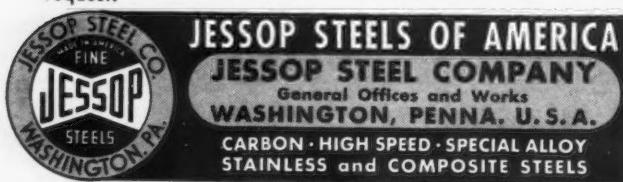


WHEN YOU BUY TRUCKS . . . **Buy "AUTOMATIC"**

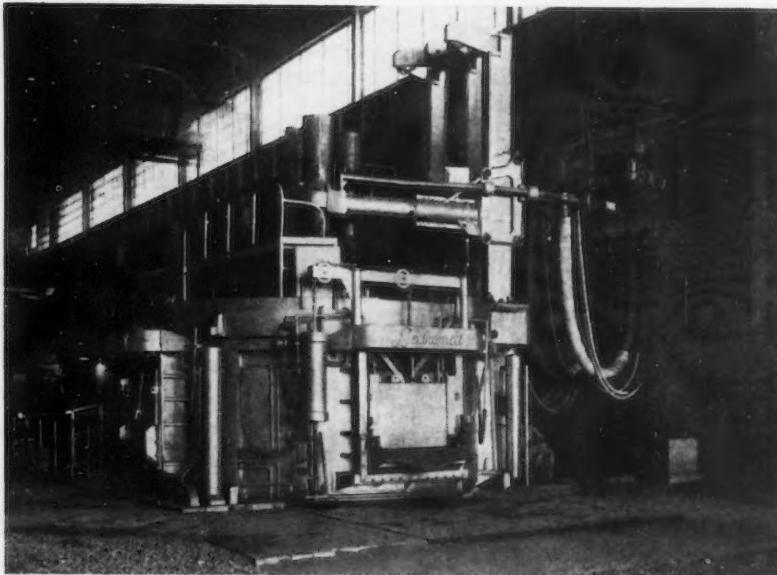
HOW JESSOP TRUFORM OIL HARDENING TOOL STEEL Speeds up Tool and Die Production

- ✓ **EASE OF HARDENING**—Jessop TRUFORM is a non-deforming tool steel which can be safely hardened by a relatively inexperienced man. Die spoilage is practically eliminated.
- ✓ **GOOD MACHINABILITY**—Jessop TRUFORM is given a special spheroidizing anneal after hammering or rolling so that it can be easily machined.
- ✓ **MINIMUM SIZE CHANGE**—Jessop TRUFORM resists size change to a remarkable degree; consequently, dies seldom need to be ground after heat treatment.

If your tools and dies are of intricate shape, or must possess extreme accuracy, play safe by specifying Jessop TRUFORM Oil-Hardening Tool Steel. Descriptive folder sent free upon request.



THE LARGEST TOP CHARGE ELECTRIC FURNACE IN THE UNITED STATES



LECTROMELT furnaces are built in sizes ranging from 100 tons to 25 pounds. Both door charge and top charge types are available. Rugged and durable construction. Rapid and economic operation.

PITTSBURGH LECTROMELT FURNACE CORP.
PITTSBURGH, PA.

SPAB Cracks Down On Civilian Expansion While Study Is On

Washington

• • • The new Supply Priorities and Allocations Board, faced with the necessity of disposing of hundreds of applications for expanding productive capacity to meet purely civilian demand, is seeking to ascertain how much of a drain on scarce materials would be involved if all the applications are approved. Pending the outcome of this study SPAB is expected to crack down on all proposed expansion of civilian industries where the projects involve "the use of large quantities of material critically needed for defense."

Following up this policy, the new super agency issued a temporary denial of a proposal to expand the Kingsport (Tenn.) plant of the Tennessee Eastman Corp., manufacturer of plastics. SPAB turned thumbs down on the project despite the estimate that the new facilities would be capable of providing plastic substitutes for 4000 tons of aluminum, 9000 tons of chrome nickel steel, 3000 tons of stainless steel, and 17,000 tons of zinc.

In specifically mentioning stainless steel as a critical material, SPAB called the construction of the additional facilities "inadvisable" in view of "an expected early winter increase in the demand for nickel for armor plate and ordnance items."

Gear Sales Index Drops 7% in August

• • • Sales of industrial gears in August, exclusive of automotive and high speed turbine drive gears, were 7 per cent below the July volume, the American Gear Manufacturers Association reports. The sales index compiled by the association stood at 276 in August, as compared with 298 in July. In August, a year ago, the index was 191. The highest point reached by the index this year was 299 reported for June. The average index for the first eight months of the current year stands at 281, against 134 in the corresponding period of 1940.

INDUSTRY

Two Lines Loading Shells at
Big Elwood Ordnance Works
Joliet, Ill.

• • • At the world's largest shell loading plant, the Elwood Ordnance Works, located about 16 miles south of here, two of the four production lines are now in operation loading 155 mm. shells and 300 lb. aerial demolition bombs. When the other two lines are in production, the plant will be loading many types from delayed action armor piercing anti-tank shells to 2000 lb. aerial bombs. In the same vicinity, the Kankakee Ordnance Works for the production of powder will soon start manufacture. Sufficient machinery has been installed, and finished construction includes two pump houses, six deep wells and permanent highways and railroads.

Two plants occupy about 65 sq. miles. Nearly 1000 buildings are on the site. The Elwood plant alone has 90 miles of track, 85 miles of paved roads, 56 miles of 10 ft. steel mesh fence. It will require 8265 workmen to operate the full plant on three shifts. Kankakee works will also require about the same number.

**Priority Setups Bothersome
To New England Industries**
Boston

• • • For a day or so following Labor Day those New England metal-working industries that closed over the holiday were slow in hitting their former high production rate, but today output appears to have hit its former high level again.

However, all branches of Maine, New Hampshire, Vermont, Massachusetts and Rhode Island manufacturing are decidedly up in the air regarding priorities and a slowing up in general New England manufacturing activity is noted. Many small concerns feel that unless they change from pursuits other than specified in their charters to defense products, it is only a question of time when they will be forced to close plants and unemployment will increase.

Large manufacturers, such as the General Electric Co., Lynn, Mass., and Westinghouse Electric & Mfg. Co., Springfield, Mass., are operating 60 to 65 per cent on defense work.

FORD TRIBLOC'S

Safe!

FORD BALL-BEARING TRIBLOCS ARE TESTED TO ONE AND ONE-HALF TIMES RATED CAPACITY ON THE LONG TON BASIS AND ALL PARTS RECEIVE A CAREFUL VISUAL INSPECTION TO AS-SURE THAT THE HIGH, LONG STANDING REPUTATION OF FORD TRIBLOC HOISTS WILL BE MAINTAINED



★ The five words printed in script at the bottom of this advertisement—"In Business for Your Safety"—are far more than a "slogan." That sentence is a basic doctrine for the entire organization. No material—no part—no process involved in the manufacture of FORD HOISTS or TROLLEYS is ever released from the unremitting search for quality and safety maintenance.

The frequent overload tests made at the factory assure more than the safety factor ordinarily required. The materials which go into FORD TRIBLOCS are certified malleable castings, high grade drop forgings and ACCO High Carbon Heat-Treated Chain. The load chain possesses high elastic limit and high tensile strength. FORD TROLLEYS are also made to the same high ACCO standards of material and workmanship.

FORD TRIBLOC capacities range from $\frac{1}{4}$ to 40 tons. They are doing magnificent work in aiding defense production.

**FORD CHAIN BLOCK DIVISION
PHILADELPHIA, PENNSYLVANIA**

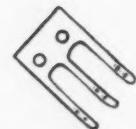


**AMERICAN CHAIN & CABLE
COMPANY, Inc.**

In Business for Your Safety

the practical side of Springmaking — BY DUNBAR

We Fix Flats (SPRINGS)



Limited technical information can be given about flat springs because of the infinite number of shapes that can be utilized. Your springmaker (us, we hope) can supply a fund of experience from past performances. Heat treating and getting flat springs through the heat treating process without vexing distortions is the springmaker's province. "You dream it and we'll do it" seems to be the appropriate message.

Dunbar Bros. Co.

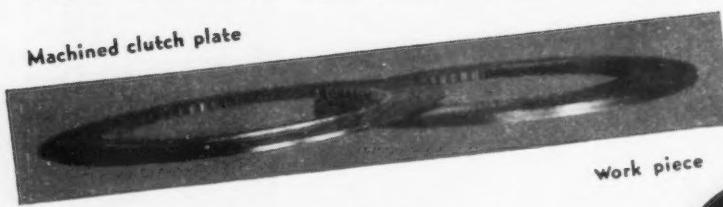
DIVISION OF ASSOCIATED SPRING CORPORATION

BRISTOL, CONNECTICUT

"Quality Springs since 1845"

KENNAMETAL TOOLS

Machined clutch plate



Work piece



**Contribute to "ALL OUT" Production
to Mechanize the U. S. ARMY . . .**

Tanks are vital in modern warfare . . . and KENNAMETAL steel-cutting carbide tools are vital in maintaining tank production schedules. Clutch plates, for example, are straddle-faced with Styles No. 3 and No. 6 KENNAMETAL tools at 260 ft. per min. and with 25 to 35 pieces per grind per set of tools. Because the KENNAMETAL tools wear uniformly, there is no "weaving" or "chattering" of the work piece—despite the thin sections being machined.

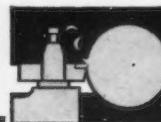
Shipping schedules for KENNAMETAL tools are entirely determined by Priority Ratings; however, good deliveries are being made on tools for non-defense work. Faster deliveries can be made on Standard KENNAMETAL tools and blanks than on non-standard items. Write for details.



KENNAMETAL
Tool No. 6T80



KENNAMETAL
Tool No. 3T80



MCKENNA METALS Co.

144 LLOYD AVE., LATROBE, PENNA.
FOREIGN REPRESENTATIVES U. S. STEEL EXPORT CO.
(Exclusive of Canada, Great Britain and Possessions)

Britain Cleared of Lend-Lease Charge

In view of charges made from time to time that steel sent to Great Britain under the Lend-Lease program had been re-exported in competition with American products, the Iron and Steel Defense Industry Advisory Committee has issued the following statement:

"This committee has examined with great interest a confidential memorandum supplied by the British Purchasing Commission regarding the use being made in the British Empire of steel obtained from the United States under the Lend-Lease program.

The committee is satisfied from this report that the Lend-Lease steel is being used in a fair, effective and proper manner.

Total steel requirements of the British under the Lend-Lease program appear to the committee to be entirely reasonable.

The committee was gratified to learn that original British requisitions for iron and steel scrap have been reduced, in view of the shortage of scrap for the operation of American steel plants, and that negotiations are now in progress to increase the proportion of finished products in the steel shipments to Britain.

Britain Standardizes Bridge Units; Spans Erected in 6 Hours

London, England

• • • A bridge of 60 ft. span can now be built by 12 men in six hours as a result of the application in a novel design of standardized bridge units by British engineers.

The basis of construction consists of five standardized steel parts—a standard girder, a circular bobbin or drum to which all cross girders can be fixed, a U-shaped hanger plate, a cross girder (for roadway and heavy bridges), and standardized floor plates, 10 ft. long and 2½ ft. wide. In spite of the fact that spans 150 ft. long can be built for heavy loads, all these parts are comparatively light. The components have been designed without projections and large numbers can thus be stacked and packed in small space.

The aim has been to provide a series of simple standard components all interchangeable, from which every type of bridge can



BOMBER-TOWING: A skilled WAAF driver tows a bomber at a British place station.

be built. In war the advantages of such equipment are evident. Equally important is the ease with which permanent bridges can be built in difficult territory where transport may be limited.

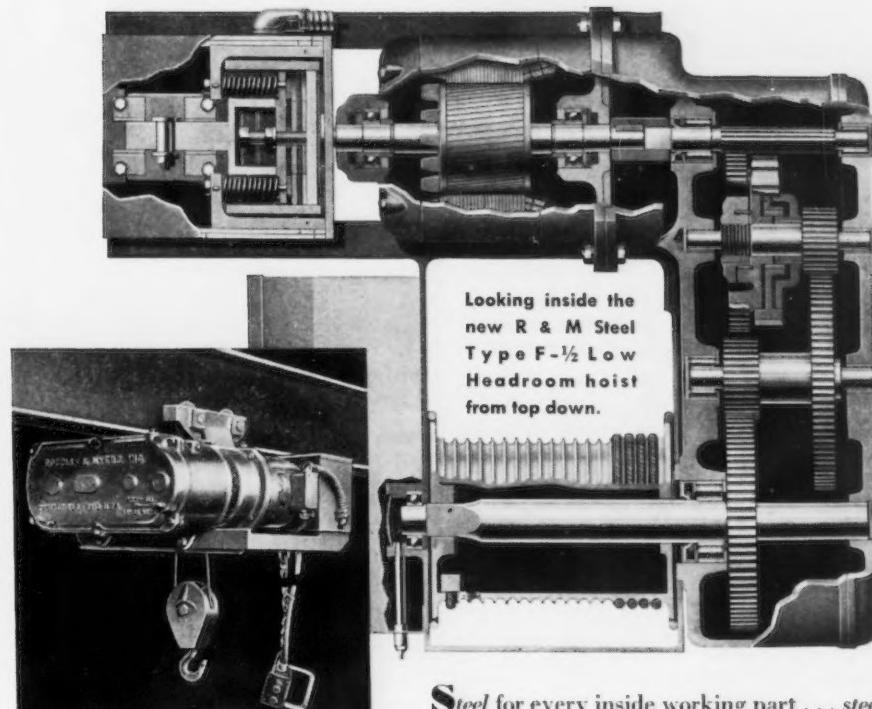
Where the bridge consists of more than one span, the intervening support takes the form of a trestle itself built from the same standard parts used for making the bridge.

Illinois Towns Protest Boosting of Union Fees

Marion, Ill.

• • • Hiking up union initiation fees for 6000 men to be employed in construction of Crab Orchard lake munitions plant has led to civic protests from nine towns in this area. Mayors of these cities met to consider methods of helping prospective employees, long out of work, get the money to meet AFL union demands. It was reported the Hod Carriers and Common Laborers' Union which formerly asked only a \$1 fee of charter members now demands \$25 from new enlistments. The electricians' union is said to have raised its fees to \$100.

Here's the "Inside" on the New R & M STEEL HOIST



STEEL FRAME—Main frame made of welded-steel plate, reinforced at "tension" points.

STEEL GEARING—Alloy-steel heat-treated gearing with tensile strength of 278,000 lbs. per square inch.

STEEL TROLLEY—Steel-plated trolley with welded-steel bumpers and safety lugs.

STEEL DRUM—Drum fabricated from steel pipe and steel flanges, jig-welded and machined.

BEARINGS—Roller, ball and bronze bearings used freely where most efficient.

LOAD BRAKE—Oversize, automatic load brake, designed to operate for years without adjustment or wear.

MOTOR—Famous R & M high-torque hoist motor, fully enclosed.

FULLY GUARANTEED—Any part proved defective within one year will be replaced without charge.

Steel for every inside working part . . . steel from track to hook . . . improved design . . . reduced headroom . . . better materials throughout. Here's your economy hoist—the new R & M Type F-1/2.

You get economy beginning with the purchase price . . . years of continued dollar savings in safe, reliable service, faster and more efficient material handling.

The new R & M Type F-1/2 hoist is built in 1,000 and 2,000-lb. capacities with pendant, push-button control, all-steel frame and for special trolleys to fit all types of monorail.

Get further "inside" facts on real material-handling savings with this new R & M steel hoist by contacting your nearest R & M sales and service office now. Or write the factory for Bulletin No. 800, advising us on the type of service the hoist is to perform. It will pay you to "take it up" with R & M.

R & M SALES AND SERVICE OFFICES

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Baltimore, Lombard & Concord St.		Denver	1420 16th St.	Pittsburgh	H. W. Oliver Bldg.
Boston	55 Long Wharf	Detroit	2921 E. Grand Blvd.	San Francisco	237 Rialto Bldg.
Buffalo	2005 Delaware Ave.	Houston	3715 Harrisburg Blvd.	Seattle	216-17 Walker Bldg.
Chicago	2400 W. Madison St.	Jacksonville	305 Bisbee Bldg.	Syracuse	204 State Tower Bldg.
Cincinnati	418 New St.	Newark	700 Bergen St.		
		Montreal	Lyman Tube & Supply Co., Ltd.		

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MOTORS • FANS • MOYNO PUMPS • FOUNDED 1878



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... and I'll show you greatly increased welding production, smoother, better welds, and a real reduction in costs."

- The all welded, T-slotted table top makes clamping a fast simple operation.
- Downhand positioned welding means better welds and less electrode waste.
- Less crane service and decreased welders' waiting time are added dividends.
- Less handling of pieces to be welded results in greater safety.

Write for Literature

Industrial Division

RANSOME CONCRETE MACHINERY COMPANY
DUNELLEN

NEW JERSEY

New Lease Agreements Approved by Defense Corp.

Washington

• • • The Defense Plant Corp., RFC subsidiary, has approved lease agreements under the defense program with these companies:

Bullard Co., Bridgeport, Conn., an increase of \$300,000 in the existing lease agreement for additional facilities needed in the manufacture of machine tool equipment.

Pullman Standard Car Mfg. Co., a \$285,152 increase for additional facilities at Chicago for the production of aircraft equipment.

Woodward Governor Co., Rockford, Ill., \$152,456 for equipment to turn out aircraft parts for the Army.

W. F. & John Barnes Co., Rockford, Ill., \$2,000,000 for constructing and equipping a plant for the manufacture of machine tool equipment for the Army.

General Electric Co., Schenectady, N.Y., a \$6,763,580 increase to existing lease agreement covering additional equipment at Erie, Pa., and West Lynn, Mass., for the production of naval equipment for the Maritime Commission.

Warner & Swasey Co., Cleveland, \$550,000 for machinery and equipment needed in the production of machine tools for the War Department.

In addition, the RFC has agreed to purchase a participation of \$7,500 in a \$10,000 private loan to Ekman & Sons Tool & Die Works, Dearborn, Mich., for defense work. The RFC also announced authorization of a \$240,000 defense loan to American Machine & Metals, Inc., New York City, for the purchase of new machinery and equipment needed for manufacturing anti-aircraft gun mountings for the Navy.

Navy Department Honors 11 More Manufacturers

Washington

• • • In recognition of outstanding achievement in the production of ordnance material for the United States fleets, the Navy Department has given honor awards to 11 manufacturing companies, bringing to 25 the number of firms to receive such recognition. Among the 11 new winners are the Bantam Bearings Corp., South Bend, Ind.; Eclipse Machine division, Bendix Aviation Corp., Elmira, N. Y.; and the General Electric Co., Erie, Pa.

The companies listed will fly the colorful Bureau of Ordnance flag and the Navy "E" pennant as a symbol of excellence. Employees will be given lapel buttons bearing the name of the company, the "E", and the Ordnance insignia.

OPM Paves Way for Priorities on Repairs For 20 Industries

Washington

• • • Superseding the OPM maintenance and repair order, which was announced Aug. 8 but never actually issued, a revised order setting up machinery under which priority status will be determined for repair work in 20 industrial classifications has been issued by Director of Priorities Donald M. Nelson.

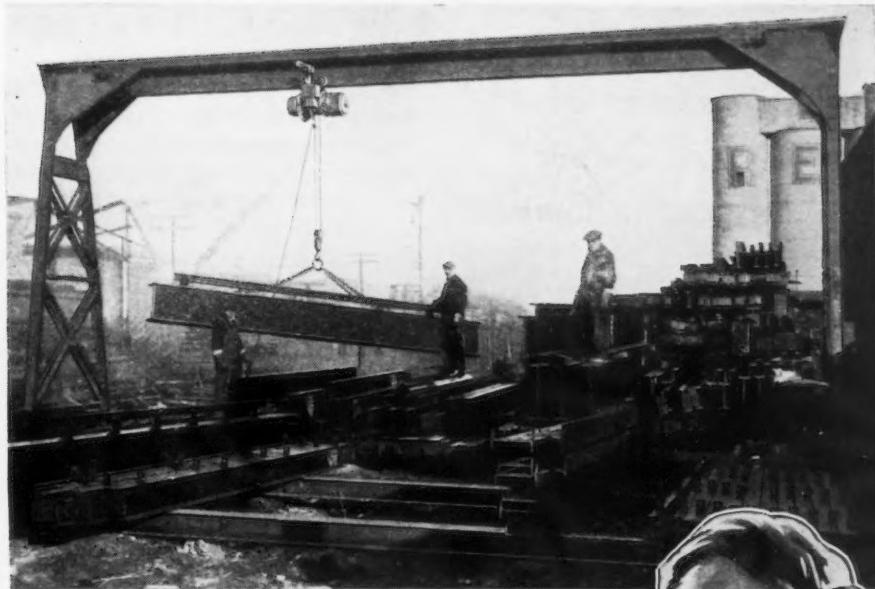
The industrial classifications, under which qualified producers or suppliers may apply a preference rating of A-10, include railroad, water, electric, and motor carriers; plants for producing chemicals, explosives, farm machinery and equipment; highway maintenance and equipment; coke converting, metallurgical plants; mines and quarries; commercial radio broadcasting and communication; research laboratories; shipyards and ship repair yards; and telephone and telegraph communication.

In order to qualify for a preference rating of A-10 for deliveries of required repair parts, producers or suppliers are instructed to make application by endorsing a special statement on purchase orders, certifying that the material being ordered is for repair work under the terms of the order, which is identified as p-22.

The order, which also can be used to get deliveries for "emergency inventory," defines "repairs" as those needed because of actual or imminent breakdown.

Designed primarily to protect industry against sudden breakdowns, the order nevertheless is regarded as an interim measure, officials hoping that broader priority assistance will be forthcoming following the completion of studies of the entire inventory problem.

The maintenance and repair order of Aug. 8 was never issued although the final draft was used as the basis of a press release sent out by OPM on that date. Mr. Nelson said the previous order was withdrawn because of "administrative difficulties in handling the paper work it would have involved."



What's Your Cost For Handling Loads Like These?

Ever pin down the cost of moving loads in yards, warehouse, or in production? Try it! And compare it with the low cost of doing it with modern P&H methods and equipment.

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Whether it's steel or cotton—whether you move it 5 or 500 feet—fast overhead handling speeds up production, cuts man and machine hours—and floor maintenance bills. These important savings increase output and reduce final manufacturing cost.

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**Sharp Curtailment of
Non-War Output
Sighted in Canada**

Ottawa, Canada

• • • The Canadian government proposes to put into effect greater restrictions on the use of iron

and steel for non-war production, through curtailment in output of civilian materials and more rigid priority regulations. C. D. Howe, minister of munitions and supply, stated "production of war materials now has reached the stage where the government will have to 'directly curtail through rationing measures' the supply of ma-

terials available to manufacturers for non-essential purposes. Rationing measures will be in conformity with the availability of needed materials for manufacture of war equipment. Plant equipment which becomes idle because of curtailed manufacture of civilian goods will be instantly utilized for war work."

Mr. Howe last week announced the passing of an order-in-Council, confirming a forecast of last July, to curtail the production of passenger automobiles for sale in Canada in 1942 to 44 per cent of the 1940 figure. This is the second reduction since the start of the war. On May 9 last the controller ordered the reduction in output of passenger cars by 20 per cent for the period April 1 to Dec. 31, 1941, from the output of the same period in 1940. Dealing with this curtailment, J. H. Berry, motor vehicle controller, showed the following estimated saving in material which may be effected next year: Cast iron and malleable, 10,000 tons; steel sheets and strip, 33,000 tons; carbon steel rods and bars, 7200 tons; alloy steel, 4600 tons; nonferrous alloys, 2000 tons; zinc and zinc alloys, 400 tons.



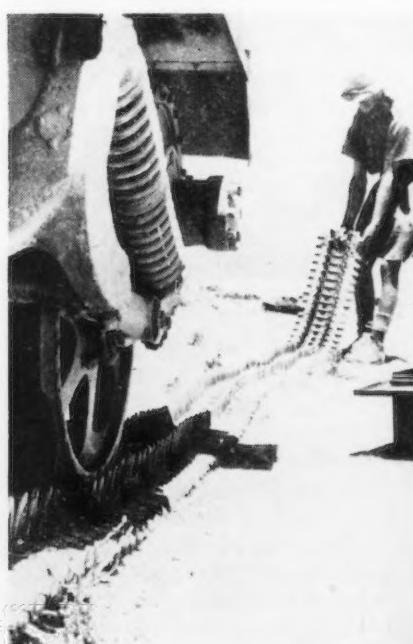
• • • **Unequalled SURFACE SMOOTHNESS and SPHERICITY**

The series of lapping operations performed as a matter of course in the Strom plant give Strom Steel Balls a degree of surface smoothness and sphericity that has always been unequalled in any other regular grade of ball. Only through such unique lapping practice can extreme precision be obtained.

Physical soundness, correct hardness, size accuracy, and sphericity are guaranteed unconditionally in all Strom Balls.

Other types of balls—*stainless steel, monel, brass and bronze*—are also available in all standard sizes. Write for catalog and prices.

UNTRACKING A GUN CARRIER:
A British soldier removes the track from a Bren gun carrier at a blacksmith shop maintained in North Africa by British forces.



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1850 So. 54th Avenue, Cicero, Ill.

The largest independent and exclusive Metal Ball Manufacturer

NEWS OF INDUSTRY

Agency Heads Named For Canada and BSC

Ottawa, Can.

• • • New agency heads have been appointed in Washington to represent the Canadian government and the British Supply Council in the United States. Edward P. Taylor of Toronto, is appointed manager of the British Supply Council, taking the place of the late Mr. Purvis, who was appointed soon after the outbreak of war. J. B. Carswell, former president of the Burlington Steel Co., Ltd., Hamilton, Ont., heads the agency of the Department of Munitions and Supply in the United States; D. B. Colyer, vice-president of Trans-Canada Airways, Winnipeg, Man., has been sent to Washington to represent F. B. Kilbourn, Canadian steel controller. Other directors under J. B. Carswell are, S. D. Pierce of Montreal, in charge of machine tools; Col. W. Mavor, Ottawa, in charge of army procurement and F. G. Rounthwaite, of Bermuda, in charge of purchasing. Morris Wilson and Edward P. Taylor, in charge of the British Supply Council, were appointed by the British government.

Canada Spends Heavily for New Vessel Construction

Toronto

• • • Orders placed by the government on ship construction and naval accounts with Canadian plants during the past week totalled \$55,062,412, the Department of Munitions and Supply announced. The most important ship construction awards went to North Vancouver Ship Repairs, Ltd., Vancouver, B. C., at \$29,673,000, and to St. John Dry Dock & Shipbuilding Co., Ltd., St. John, N. B., at \$2,298,240, with other individual awards ranging from \$164,000 to \$270,000.

Included in the total expenditure are orders for 9000 units of naval equipment, valued at \$5,000,000 placed with Manitoba Bridge & Iron Works, Ltd., Winnipeg, Man. About 75 per cent of the steel to be used in the order will be rolled in Western Canada.

Other large orders involved in the naval contracts went to Chrysler Corp. of Canada, Ltd., Windsor, Ont., for shells at \$4,850,000; Western Clock Co., Peterborough,

Ont., fuses, \$1,850,000, and Beatty Bros., Ltd., Fergus, Ont., units of equipment, \$10,000,000.

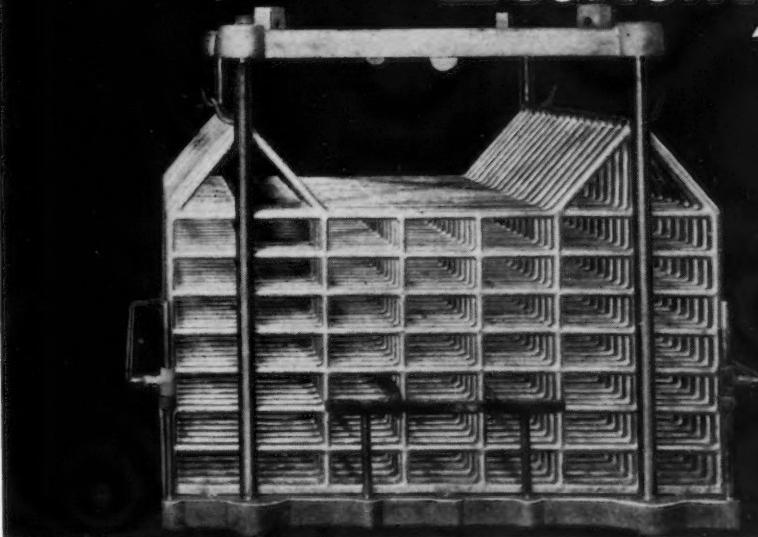
The largest structural steel award by the government to date, announced last week, went to Dominion Bridge Co., Ltd., Lachine, Que., with total value of \$2,912,868. War projects and defense construction contracts placed during the week were valued at \$13,804,887.

McKee Contracts Running 37% Over 1940 Period

Cleveland

• • • Arthur G. McKee & Co., engineers and contractors, have received a dollar volume of contracts during the first eight months of 1941 which is 37 per cent above that of the similar period of 1940.

QUALITY is— *Economy*



Grid type TIN MILL PICKLING CRATE

The Patented Grids increase your production and eliminate seconds.

(Patent No. 1,858,430—Re-issue 17,882)



WHEELING, W. VA.

1,000 Youths in Training At Pullman-Standard Plants

Chicago

• • • About 1000 youths are going through training courses for defense work at Pullman-Standard Car Mfg. Co. plants in this area where army bomber wings, trench mortars, shell forgings, tanks and howitzer carriages are being made.

Pretraining courses in vocational schools cover six weeks of daytime instruction; 16 weeks at night. Following this, supplementary training in Pullman shop procedure, lasting from two to four weeks, is given by the firm's own instructors. Pullman expects to get about 275 sheet metal workers each month from the training group.

More Illinois Firms Join To Handle Defense Business

Bloomington, Ill.

• • • To help maintain employment, manufacturers here have fallen in line with the state movement to pool community facilities for obtaining defense contracts. Among the firms reported hard hit by lack of materials are Williams Oil-O-Matic Corp., which has laid off 15 per cent of its force in the past month; the Meadows Corp., makers of washing machines; Portable Elevator Co.; and a number of foundries and sheet metal companies.

The move here was preceded by similar action in several Illinois cities and this week gained official sanction of Gov. Dwight Green and the State Council of Defense who announced plans to aid in the pooling of community facilities to handle defense business.

At Newton, Iowa, the jobs of about 300 Maytag Co. employees are more secure now that the washing machine manufacturer has obtained a \$1,500,000 order for Martin bomber plane parts. Maytag normally employs over 1300 but their jobs had been threatened by the reduction in washing machine production. So far the company has obtained about \$2,000,000 in defense work and is studying its plant facilities to get more.

New August Record Set by U. S. Steel Corp. Shipments

• • • August shipments of finished steel by United States Steel Corp. subsidiaries, at 1,753,665 net tons, were the best on record for that month.

The August record compares with 1,666,667 net tons in the preceding month (July), an increase of 86,998 net tons, and with 1,455,604 net tons in the corresponding month of 1940 (August), an increase of 298,061 net tons.

For the year 1941 to date, shipments were 13,473,209 net tons compared with 9,040,889 net tons in the comparable period of 1940, an increase of 4,432,320 net tons.

Shipments in the first eight months of 1941 exceeded any similar period in the history of the corporation. The previous eight months' record was 12,187,424 net tons in 1929.



You save TIME and MAN-POWER for production when you use Kinnear Motor Operated Steel Rolling Doors. With them, you can close or open any doorway quickly — from control switches placed at as many separate and convenient points as you desire—by simply touching a button. Now is the time to install this rugged, all-steel protective door

with the efficient, interlocking steel-slat curtain* the door that opens straight upward and saves floor and wall space by coiling compactly out of the way above the opening. Any size, for old or new buildings. Write for details today! Address The Kinnear Mfg. Co., 1760-80 Fields Ave., Columbus, Ohio.

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CLOSES
LIGHT-TIGHT

Ideal for BLACKOUT PROTECTION!

Saving Ways in Doorways
KINNEAR
ROLLING DOORS

Pig Iron Shipments**Affected by Stocks**

• • • While many pig iron users with priority ratings no better than B-1 have been surprised at the generous treatment accorded their needs in the September pig iron schedules, considerable concern is felt over the October schedules when, it is felt, they will be much more tightly drawn.

Inventories apparently played an important role in the OPM determination of September allotment. Thus, some users with rating as high as A-10 found their shipments sharply curtailed due to their good inventory position. The fact that some plants still have comfortable inventories also served to cushion the concentration of September supplies on defense work. As these inventories are forcibly worked off it is expected that the full effect of the concentration of iron supplies in defense plants will be felt by plants without defense orders.

On the whole, the pig iron trade is outspoken in commanding the expeditious manner in which the OPM has tackled the complex problem of putting the iron priority order on a working basis.

The chief source of complaint, however, arises from the fact that iron producers are still forced to absorb freight on shipments outside their respective basing points, in contrast with the fact that steel producers are enabled to sell on an f.o.b. mill base in such cases. Agitation is said to be increasing for a change in the pig iron price schedule to permit using an f.o.b. price, plus transportation charges, as the basis of pricing shipments outside a basing point area.

Hillman to Operate Chester Blast Furnace Philadelphia

• • • Hillman Coal & Coke Co., Pittsburgh, recently completed negotiations with Philadelphia Electric Co., for the purchase of the blast furnace on property recently acquired by the electric company at Chester, Pa. While

official confirmation of the negotiations has not yet been released, it is understood that the Hillman interests will spend about a half million dollars in rehabilitating the furnace to produce ferromanganese. A battery of Koppers coke ovens was recently completed for Philadelphia Electric Co. on property adjacent to the furnace, and will probably serve as a fuel source.

Granite City Unit in Blast

• • • One of the long-idle blast furnaces of the former Granite City Pig Iron Co. went into the production of pig iron on Sept. 15. The plant was purchased recently by Koppers United Co. and has been rehabilitated to produce 700 gross tons of pig iron a day, about half of which will be delivered in a molten state to nearby Granite City Steel Company.

**a 24 hour
REVEILLE!**

**on
SPRINGS
WIRE SHAPES
SNAP-CLIPS, etc.
FOR U. S. DEFENSE**

KEEP SPRINGS FLOWING to industry... keep production on a continuous, unbroken schedule, 24 hours a day where necessary... that's Cuyahoga's contribution to Uncle Sam's defense program and industry's production needs!

If you need springs, wire shapes, or Snap-Clips as a vital part of your supply line, Cuyahoga has the production facilities, the precision and the craftsmen to serve you dependably.



Steel Output Seen Hit by Coal Strike

Pittsburgh

• • • Although most steel companies involved in the captive mine strike have from two to three weeks' supply of coal above ground, some direct effect of the strike may be felt by the end of this week or the first of next week

if the shutdown is still in progress. First curtailment on steel production may come because of lack of beehive coke supplies which furnish from 6 to 10 per cent of the pig iron fuel in the greater Pittsburgh district. The flow of coal for beehive coke ovens operated and controlled by steel companies was stopped as soon as the strike began.

Meanwhile, the question of a union shop which has caused the United Mine Workers' walkout at the captive mines has been thrown back into the lap of the National Defense Mediation Board which so far has not yet settled this question in a clear cut manner even though it was the fundamental cause for the taking over of the Federal Shipbuilding plant at Kearny, N. J. The Mediation Board now has the issue of the union shop involved in the captive mine shutdown before it in connection with the Alabama coal mining situation.

Exception in the captive mine strike is the Jones & Laughlin Steel Corp. which several weeks ago signed the union shop agreement with the UMW. Approximately 43,000 miners in the Western Pennsylvania district supplying coal for U. S. Steel, Bethlehem, Republic and Wheeling Steel companies have been on strike since Monday of this week and on Tuesday showed no inclination to resume operations pending mediation of the dispute.

The strike, although having the aspects of a sudden move, was no surprise to inner steel circles since negotiations have been going forward on the union shop question for several weeks. The UMW, it is understood, had placed a deadline of Sept. 15 on their demand for a union shop.

Although steel companies have refused to insert the union shop clause in the coal contracts, informed observers here look for the Mediation Board to rule in favor of the union demand, since practically all commercial coal contracts include this provision. Previous union contracts covering captive mines had not in most cases carried the union shop clause, but it is pointed out that the only effective representation has been in fact through the United Mine Workers Union. It is this condition, according to some sources, plus the fact that commercial coal mines carry the union shop contract that make the UMW demand likely to be recommended by the Mediation Board. The latter, however, faces a serious decision in view of the drive throughout entire industry for some form of closed shop or check-off.

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*with QUICK, CLEAN
DUMPING ACTION*

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INDUSTRIAL CARS (TRACK AND TRACKLESS)

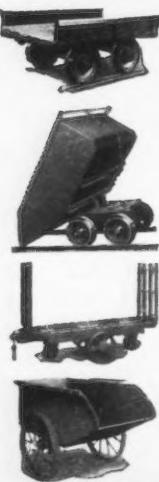


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OVER 75 DIFFERENT TYPES

Here's a line of industrial cars that will cut your haulage costs, yet give maximum service with least maintenance. Rugged construction plus quick, clean dumping action means top speed haulage on all your operations. Koppel Cars have a proven record in the most grueling service throughout the industrial world.



The Koppel line includes over 75 types of cars for every conceivable material handling requirement. Bulletin No. 71 describes Koppel End Dump Cars, Side Discharge Cars, Platform Cars, Track and Trackless Equipment, and the famous Koppel Air Dump Cars and Ladle Cars. Do you have a copy in your files for ready reference?

PRESSED STEEL CAR COMPANY, INC.
(KOPPEL DIVISION)
PITTSBURGH, PA.

NEWS OF INDUSTRY

Sitdown Strike Cuts Pittsburgh Steel Rate

Pittsburgh

A sitdown strike of maintenance and coke oven operators at Carnegie-Illinois Steel Corp.'s by-product coke plant at Clairton, Pa., near here, caused a shutdown of three blast furnaces and 44 open hearth furnaces Tuesday of this week. The shutdown of steel making facilities at three plants was caused by lack of by-product coke oven gas used as a fuel in open hearths, soaking pits, and steel heating furnaces. The Clairton by-product plant furnishes this fuel for Carnegie's Pittsburgh district plants.

The sitdown strike, first large one of its kind in the steel industry, was precipitated when maintenance and by-product coke oven attendants who control the charging and discharging of the coke ovens refused to work with non-union members.

The work stoppage, interpreted by observers as a violation of the contract between the company and the SWOC, was still in progress late Tuesday afternoon. Loss of steel production, even during a short period, will retard fulfillment of some Army and Navy orders.

Federal Alloy, Idle Since 1921, to Resume Operations

Philadelphia

• • • Federal Alloy Steel Corp., at Eddystone, Pa., will resume operations, it was reported this week. Last operated in 1921, the company then had a rated annual ingot capacity of 35,000 tons and produced special carbon and alloy steel bars, merchant bars, deformed reinforcing bars, and large round forgings. Reports that Heller Bros., Newark, N. J., would operate the plant were denied by company officials.

Koppers Co. Gets Contract For Brazilian Coke Plant

Pittsburgh

• • • Koppers Co. has been awarded a contract for a complete by-product coke plant, consisting of

Becker type coke ovens, including a plant for the recovery of ammonia, tar, benzol, toluol, etc., for the Companhia Siderurgica Nacional (Brazilian National Steel Co.), near Rio de Janeiro. The contract was said to involve approximately \$3,000,000.

The new coke plant is to be

built in connection with a blast furnace and steel mill. The contract was negotiated with Lt. Col. E. Macedo Soares E. Silva, technical director of the Brazilian company, with offices at Cleveland, and the Arthur G. McKee Co., who are engineers for the entire Brazilian steel plant project.

TO KEEP PRODUCTION UP



STEEL PICKS
PENOLA

FASTER and faster comes the demand for steel. For bombs and bombers—for ships and shells—for trucks, tanks and a host of other defense weapons. Mills must not falter or fail—they've got to keep rolling out the tonnage without hold-up or let-down. To help insure that this pace will not prove too great, steel men use Penola lubricants. Despite tremendous pressures and the most searing temperatures, there'll be no metal-to-metal contact, with Penola on the job. Safeguard your mills this production-proved way. Learn why more Penola greases are used by the steel industry than any other make in the world. Call on Penola's engineers today!

PENOLA LUBRICANTS

Penola Inc., Pittsburgh, Pa.
(Formerly Pennsylvania Lubricating Co.)
New York • Chicago • Detroit • St. Louis

LUBRICANTS FOR THE STEEL INDUSTRY SINCE 1885

On The Assembly Line

(CONTINUED FROM PAGE 84)

war that are facing the country. Special efforts are being made to inculcate a spirit in the workers that will prevent the waste of valuable materials such as aluminum and alloys required in airplane production.

From other sources it was learned that Briggs shortly will participate in manufacture of parts for Chrysler tanks. It is possible that extensive tool and die shop facilities formerly used for tooling up the body production will be employed for machining tank parts when Chrysler steps up its output from the current level of about 10 a day to 40 a day.



For the Dust-Bowl Jobs— AIR or HIGH-CYCLE?

Foundries, for example. Dusty air is drawn through the tool. Dirt sometimes gets into exhaust ports, bearings and motor. Tools are often dropped in the sand. What would I recommend—Air or High-Cycle?

For the average foundry—Air. Because: (1) Air tools are about 2 to 6 lbs. lighter than corresponding High-Cycle tools—easier to handle—get more work out under average foundry conditions. Air is usually available anyhow. (2) Maintenance of air tools is simpler and easier for the average foundry repair shop.

When High-Cycle? (1) For lower first cost. (2) For lower power cost. (3) When proper care can be taken of the tools. (4) When you want to eliminate the dust-blowing caused by Air tools. (5) When you want quiet operation.

I'm unbiased. Perhaps modern Air tools should be used in your foundry or shop—or perhaps High-Cycle tools. It depends on your own problems. I can recommend either type to assure you tops in performance and satisfaction. Call me in. No obligation, of course.

THE ROTOR ANALYST

The Rotor Analyst has 65 different Air tools and 59 different High-Cycle tools with which to solve your problems.



Lower maintenance and lighter weight usually favors the selection of Air tools for "dust-bowls" such as the foundry. Complete details on Rotor Air Tools in Cat. 24 (gratis).

AIR

THE ROTOR TOOL CO.

CLEVELAND, OHIO

UNBIASED ANALYSIS OF PORTABLE TOOL PROBLEMS

HIGH CYCLE

GENERAL MOTORS' announcement of the fact that it soon would build tanks was made by C. E. Wilson, president, at a Proving Ground demonstration of the defense materials and commercial products of General Motors Corp. He did not elaborate on his remarks, but its significance in connection with helping to solve the unemployment problem of next winter was emphasized. He stated that on the basis of total facilities and total employment at present, G.M. could handle almost twice its present total of defense orders which to date have exceeded \$1,200,000. The corporation faces the prospect of a 54 per cent cut in auto production during the 1942 model year and this will force lay-off or transfer of around 100,000 people within the next six months, Wilson said. Against this Wilson estimated that the corporation's defense projects would employ an average of 5,000 workers a month for the next six months, leaving a balance of 70,000 workers to be taken care of.

Wilson (and several other automotive leaders during the week of previews) stated in an address to the corporation's guests that: "Basic materials should be available, after all defense requirements, in sufficient quantity to maintain a minimum replacement supply of the so-called consumer durable goods."

GENERAL MOTORS' display of military equipment included all of the types of automotive vehicles being produced for the Army and Navy, plus the Allison engine, Oerlikon anti aircraft gun, shells, diesel engines, fire control apparatus, bomber parts, autosyn motors for aviation control signals and other similar products. The General Motors display also included flight demonstrations of the Bell Airacobra and Lockheed Interceptor which are powered with Allison engines. It was concluded with a mimic blitzkrieg staged in a valley of the proving grounds with tanks, trucks and airplanes participating.

Three important engine developments were revealed by Edsel Ford during the preview of 1942 Ford, Mercury and Lincoln cars. At the same time the Ford Motor Co. displayed the progress in the construction of its bomber plant and

ON THE ASSEMBLY LINE

Showed how it is swinging into production of Pratt & Whitney engines for the Air Corps.

The latest engine developed by Ford is a liquid-cooled pancake type, Edsel Ford revealed, to be mounted within airplane wings to reduce wind resistance to a minimum. It was put on dynamometer test last week. The test engine, he said, is an 8-cylinder engine with two crankshafts which are geared together to drive a propeller. The combustion chambers and fuel supply system are in the center of the engine, and the crankshafts are on the outside. Ford did not elaborate on this description but apparently this is the same engine as the one that has been modeled in wood and was displayed by Mr. Sorenson earlier this year. In its full-size version, it will be a 12-cylinder pancake engine.

The second important engine development displayed was Ford's own V-12 liquid-cooled aviation engine which has been on test since Aug. 2. Viewing this engine on the test stand offers a chance to size it up and compare it with some of the others. At the time of the demonstration it was operating at only about 1600 r.p.m. but test charts reveal that its horsepower output has exceeded 800 at 3600 r.p.m. without a supercharger. The exhaust driven supercharger is undergoing separate mechanical tests and is expected to bring the engine to 1800 hp.

Edsel Ford also revealed that a V-8 liquid-cooled tank engine is being developed. It is identical in general layout with the V-12 engine but has carburetion of the conventional type, instead of the fuel injection system that will go on the airplane engine. It is predicted that it will develop 400 hp.

THE \$37,000,000 Pratt & Whitney airplane engine plant is in production at a rate exceeding one engine per day on the 1850 air-cooled aviation engines that Ford has contracted to build.

The bomber plant, also viewed during the day, is being constructed rapidly. At present, about half the structural steel has been erected and the first runways on the adjoining airport are being prepared.

Another defense progress report made during the week was by Hudson which showed its \$20,000,000 Naval Ordnance plant to a group representing the press on Tuesday.

In completed portions of the plant production is already underway on the Oerlikon anti-aircraft gun. The arsenal will include 14 buildings on a 135-acre site. At present the majority of these buildings are nearing completion.

Hudson also is in production on pistons and rocker arms for the Wright cyclone engine and these parts are being shipped to the new Wright plant near Cincinnati. In

another section of the plant Hudson is clearing a building for production of rear fuselage sections for the Martin B-26 bomber. Tooling on this project is underway.

Automobile production in the second week in September reached 53,165 units (passenger cars and trucks) compared with 32,940 in the previous week and 63,240 in the corresponding week of last year, according to Ward's Reports, Inc.

It reduces a whole series of processes to ONE OPERATION

ROCKWELL ROTARY ANNEALING FURNACE (retort type)

THE demand for brass cups by cartridge manufacturers will soon eclipse all other production in the brass industry. Brass mills will be limited only by their capacity to produce them.

Rockwell Rotary Annealing Furnaces of the Retort Type, like the one shown above, running since the beginning of the present war, have an outstanding record for annealing 30 and 50 calibre cartridge case parts.

The unit consists of a skip taking the work from the floor and charging it into a washing machine unit. From this point it travels through a washer, annealing furnace, and various stages in the pickling and washing machine.

The cartridge case parts are handled through all the operations in a continuous even stream. They are charged hard and oily and discharged soft, pickled and dried. This furnace is exceptionally economical from the standpoint of labor—there is no intermediate handling—as well as in fuel and the use of acid.

You can do your share if you have the right furnace equipment—NOW is not too soon.

Write for Catalog No. 3971



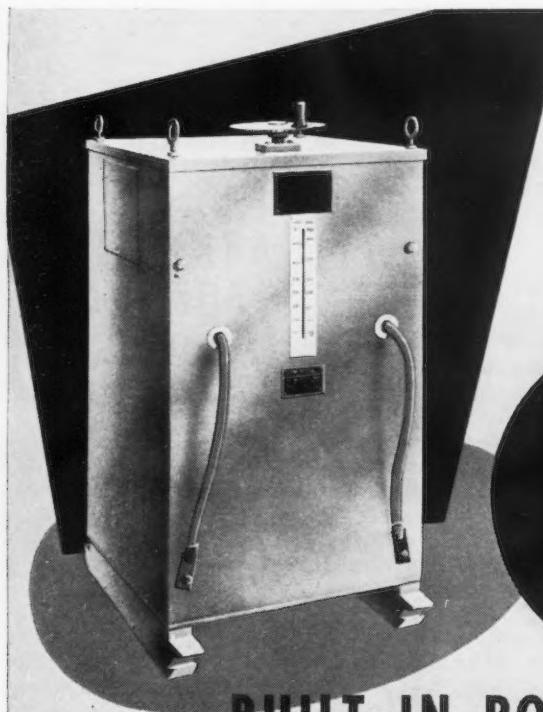
Government Awards . . .

War Dept., Ordnance:

Allegheny Ludlum Steel Corp., Brackenridge, Pa.; gages	\$19,325
inspection gages	4,642
American Air Filter Co., Inc., Louisville, Ky.; precipitator dust	1,399
American Brake Shoe & Foundry Co., American Forge Division, Chicago; shot, body and cap forgings	59,555
American Brass Co., Waterbury, Conn.; bronze, manganese brass	4,603
American Car & Foundry Co., New York; supports, engine assembly and wheels, bogie	3,984
American Locomotive Co., Latrobe, Pa.; parts for tanks	9,316
American Locomotive Co., Railway Steel Spring Division, Latrobe, Pa.; rings and racks for tanks	1,023
American Manganese Bronze Co., Philadelphia; manganese bronze	1,058
American Screw Co., Providence; screws	1,115
Apex Tool & Cutter Co., Inc., Shelton, Conn.; tapered blades	6,886
Arguto Oilless Bearing Co., Philadelphia; punches	4,417
Armstrong-Blum Mfg. Co., Chicago; hack saws	2,800
Armstrong Cork Co., Lancaster, Pa.; detonators	1,794
Associated Spring Corp., Wallace Barnes Co. Div., Bristol, Conn.; ejector clips	4,987
springs, butt plate plunges	14,412
Atlantic Elevator Co., Philadelphia;	1,350

drive, traversing & elevating, all electric	2,000
Atlantic Metal Hose Co., Inc., New York; tubes	3,870
Axelson Mfg. Co., St. Louis; forgings	754,960
Barber-Colman Co., Rockford, Ill.; reamers	27,900
milling cutters	2,476
Barker Tool Die & Gauge Co., Detroit; gages	6,552
John Bath & Co., Inc., Worcester, Mass.; taps	3,750
Bauer Brothers Co., Springfield, Ohio; shells	1,930,500
Bay Products Corp., Newton, Mass.; carbon removing tools	219,902
Bay State Abrasive Products Co., Westboro, Mass.; grinding wheels	1,111
Bendix Aviation Corp., Bendix Products Division, South Bend, Ind.; parts for carburetors	56,051
Bendix Aviation Corp., Julien P. Friez & Sons Div., Baltimore; furnish & install indicating & recording wind system	1,427
Bethlehem Steel Co., Bethlehem, Pa.; steel	102,750
E. W. Bliss Co., Brooklyn; power presses	1,585
J. G. Brill Co., Philadelphia; forgings	15,022
Bristol Brass Corp., Bristol, Conn.; brass	42,900
Brown Lipe Gear Co., General Drop Forge Div., Buffalo, N. Y.; drop forgings	1,855
Brown & Sharpe Mfg. Co., Providence, R. I.; grinding machines	17,545

Buda Co., Harvey, Ill.; assemblies, exhaust ring	29,280
Candler-Hill Corp., Detroit; parts for tanks	9,848
Carnegie-Illinois Steel Corp., Pittsburgh; steel bar	10,802
Chase Brass & Copper Co., Waterbury, Conn.; retainers	7,951
Chelsea Clock Co., Chelsea, Mass.; clocks & carrying cases	6,129
Cincinnati Bickford Tool Co., Cincinnati; drill presses	8,352
Cincinnati Lathe & Tool Co., Cincinnati; lathes	4,216
Cincinnati Milling Machine & Cincinnati Grinders, Inc., Cincinnati; grinding machines	15,897
Cleveland Cutter & Reamer Co., Cleveland; tools	7,546
Cleveland Tractor Co., Cleveland; track assemblies	1,072
Cleveland Twist Drill Co., Cleveland; reamers	1,188
Collins Electric Co., Inc., Springfield, Mass.; parts for panel boards, circuit breaker	2,292
Collis Co., Clinton, Iowa; parts for tanks, dies and studs	7,274
Consolidated Machine Tool Corp., Rochester, N. Y.; lathes	19,145
Colonial Alloys Co., Philadelphia; duralumin for small arms experimental work	1,198
Columbus Forge & Iron Co., Columbus, Ohio; forgings	3,458
H. D. Conkey & Co., Conco Engineering Works Division, Mendota, Ill.; cranes	23,290
Continental Motors Corp., Muskegon, Mich.; parts for tanks	2,350,271
C. Cowles Co., New Haven, Conn.; oilers	39,547



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AND NON-FERROUS METALS



BETTER — AND FROM
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THAN MANUAL WELDING

GOVERNMENT AWARDS

Crescent Electric Supply Co., Davenport, Iowa; transformers and capacitors	2,995	General Tool Sales Co., Philadelphia; tools	3,320	Charles E. Larson & Sons, Inc., Chicago; steel rings	4,731
Crucible Steel Co. of America, Syracuse; steel	2,987	Goodman Mfg. Co., Chicago; forgings and yokes, carbon steel	100,453	LeBlond, R. K., Machine Tool Co., Cincinnati; centers, live tailstock, built in	1,330
Crucible Steel Co. of America, Spaulding & Jennings Works, Jersey City, N. J.; steel strip ..	4,415	Goodyear Tire & Rubber Co., Akron, Ohio; track assemblies	3,584	Leitelt Brothers, Chicago; castings, phosphor bronze	9,539
Cutter Wood & Sanderson Co., Hartford; screws, nuts and bolts ..	3,319	George Gorton Machine Co., Racine, Wis.; milling machines	31,287	Lincoln Park Tool & Gage Co., Lincoln Park, Mich.; gages	1,762
Derbyshire Machine & Tool Co., Philadelphia; heading dies	11,850	Great Lakes Steel Corp., Ecorse, Detroit; steel	20,842	Lindberg Engineering Co., Chicago; furnaces	8,270
A. P. De Sanno & Son, Inc., Phoenixville, Pa.; grinding wheels	1,101	Greenfield Tap & Die Corp., Philadelphia; hand taps, high speed steel	3,325	Logan Co., Inc., Louisville, Ky.; ball bearings	1,482
Dreis & Krump Mfg. Co., Chicago; press brakes	43,576	Guiberson Diesel Engine Co., Chicago; engines	2,282	Magna Mfg. Co., Inc., Haskell, N. J.; magnesium	48,400
Eclipse Aviation Division, Bendix, N. J.; parts for starters and generators	2,475	Gulf Coast Machine & Supply Co., Beaumont, Tex.; forgings	39,873	Mattatuck Mfg. Co., Waterbury, Conn.; retaining springs	34,800
Edgcomb Steel Co., Philadelphia; forgings	13,451	Hadley Special Tool Co., Boston; gages	21,497	screw eyes	1,800
Edgewater Steel Co., Oakmont, Pa.; forgings	45,551	Hendey Machine Co., Torrington, Conn.; metal shapers	129,490	The Midvale Co., Nicetown, Philadelphia; forges steel rings	5,580
A. B. Farquhar Co., Ltd., York, Pa.; presses, straightening, hydraulic	29,840	Heppenstall Co., Philadelphia; blocks, die	3,921	Midwest Tool & Mfg. Co., Detroit; Mich.; milling cutters	1,176
Firth-Sterling Steel Co., McKeesport, Pa.; bottom dies	1,162	Albert Hepworth, Philadelphia; milling machines & lathes	2,982	Modern-Bond Corp., Wilmington, Del.; repair parts, feed screws, extensions and feed changes	1,056
Charles Fischer Spring Co., Brooklyn; springs	4,192	Hunter Engineering Co., Riverside, Cal.; machines	6,918	Modern Tool & Die Co., Philadelphia; gages	3,060
Frick-Gallagher Mfg. Co., Wellston, Ohio; units—rotating type and dividers	70,817	Hydraulic Controls, Inc., Chicago; parts for tanks	21,960	Mount Vernon Die Casting Corp., Mt. Vernon, N. Y.; ogives	21,543
Gages Rubber Co., Sales Division, Denver; belts and blocks	1,266	Illinois Tool Works, Chicago; cutters	10,097	Morse Tool Co., Inc., Detroit; tools	340,620
Gas Weld Equipment Co., Boston; welding supplies and equipment	2,995	Johnson - Clafin Corp., Marlboro, Mass.; gages	5,313	Murdoch Tool Co., Inc., Detroit; counterbore cutters	2,336
General Motors Sales Corp., Hyatt Bearing Div., Chicago; bearings	1,588	John P. Kelly, Philadelphia; castings	2,815	McCord Radiator & Mfg. Co., Detroit; electric machines	22,500
General Time Instruments Corp., Seth Thomas Clocks Division, Thomaston, Conn.; fuse parts ..	1,137	W. B. Knight Machinery Co., St. Louis; milling machines	1,492	McKenna Metals Co., Latrobe, Pa.; tools	1,515
	149,610	H. R. Krueger Co., Detroit, Mich.; fixtures	14,805	McQuay-Norris Mfg. Co., St. Louis; pistons pins and piston rings	6,797
		A. B. Landis Sons, Inc., Philadelphia; bumpers	1,560	National Automatic Machine Co., Richmond, Ind.; tapping machines	11,150
			1,562	National Foundry & Machine Co., St. Louis; castings, phosphor bronze	5,118



IN EXPORT

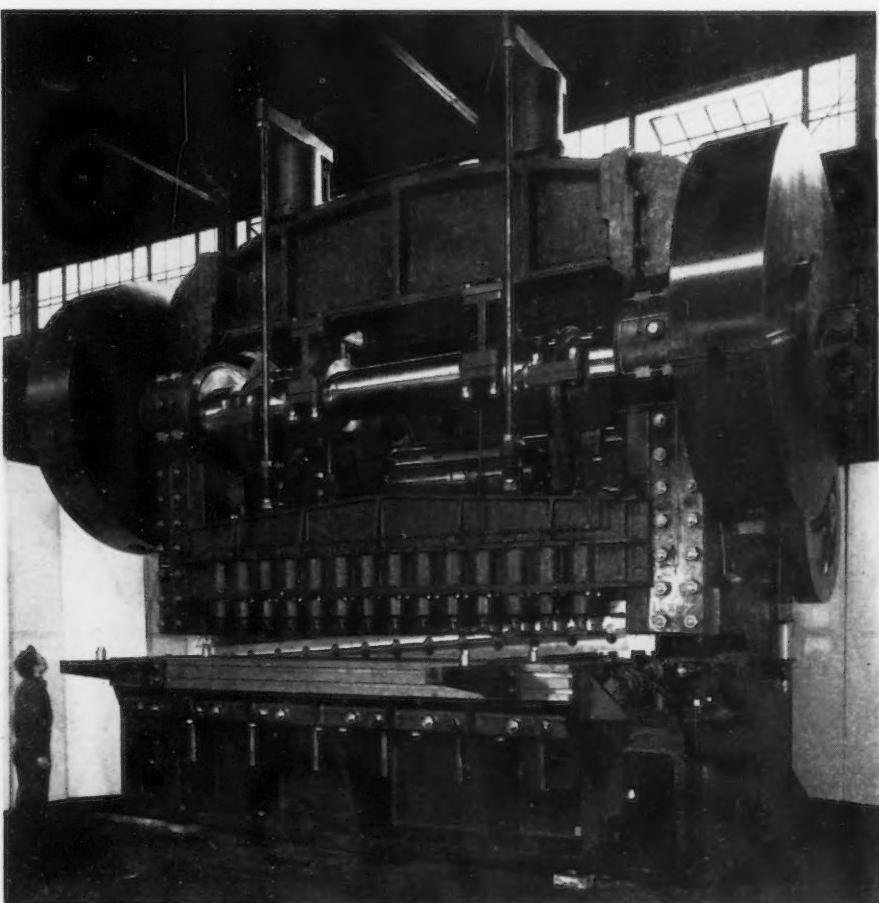
SINCE 1903

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Cable Address: "STEELMAKER" New York

GOVERNMENT AWARDS

National Wire & Cable Co., Pittsburgh; wire	1,277	Ohio Seamless Tube Co., Shelby, Ohio; seamless steel tubing	1,196
New York Thread Grinding Corp., New York; gages	2,236	Oliver Farm Equipment Co., Springfield, Ohio; firing pin bases	1,240
Nicholson File Co., Providence, R. I.; parts for guns	5,656	Otis Steel Co., Cleveland; steel	2,091
Niles-Bement-Pond Co., Pratt & Whitney Division, Hartford, Conn.; drills	5,250	Pangborn Corp., Hagerstown, Md.; grit, angular steel	2,190
grinders	3,925	Parish Pressed Steel Co., Reading, Pa.; accessories, bundle packing	409,912
gear hobbing machine	7,688	Park City Tool & Die Co., Bridgeport, Conn.; fixtures, milling	1,280
Norco Metal Products Co., Philadelphia; ejecting stems	3,960	Penn Tool Co., Philadelphia; screw drivers	3,658
Norma-Hoffman Bearing Corp., Stamford, Conn.; bearings	1,708	Phosphor Bronze Smelting Co., Philadelphia; phosphor bronze	2,579
Norton Co., Worcester, Mass.; cutters and tool grinders	2,059	Poor & Co., Canton Forge & Axle Works, Canton, Ohio; forgings	36,624
grinding wheels	1,336		



The World's Largest—

PLATE SHEAR

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Designed and built in the Thomas shops—cast steel construction throughout, the shear has a capacity for cutting plates up to $2\frac{1}{2}$ inch thick by 13 ft. 6 in. wide in ordinary steel.

Latest in design—Timken equipped flywheel shaft carries newly developed magnetic clutch.

Permits stopping the ram at any point of the stroke and allows "inching" the ram down for cutting to a mark.

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Keep oily waste in the
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Oily Waste can be as
dangerous as a fire-bomb

REPORT
FAULTY WIRING

Electrical fires are hard to control

FIGHTING PLANT FIRES: Bethlehem Steel Co. designed these tailor-made posters to warn their employees against dangers of fire which might threaten delay in production material and equipment.

Porter-McLeod Machine Tool Co., Inc., Hatfield, Mass.; lathes	3,306
Portland Forge & Foundry Co., Portland, Ind.; forgings	127,000
Pringle Electrical Mfg. Co., Philadelphia; switchboard & power panel	3,866
Production Tool & Die Co., Inc., Springfield, Mass.; jacks, barrel straightening	2,400
gages	1,296
Putnam Tool Co., Detroit; end mills	1,340
Quality Hardware & Machine Corp., Chicago; motor drives and installation	38,304
Rahaim Machine & Tool Co., Gardner, Mass.; gages	1,766
A. B. & J. Rathbone, Palmer, Mass.; steel	6,741
Reed Mfg. Co., Erie, Pa.; strap wrenches	11,982
Rotary Electric Steel Co., Detroit; steel	4,418
Joseph T. Ryerson & Son, Inc., Chicago; steel	3,402

GOVERNMENT AWARDS

S.A.E. Steels, Inc., Cleveland; steel	1,024	Zimmerman Steel Co., Bettendorf, Iowa; steel	9,052	Ind.; carburetors and spare parts	466,168
Safe Guard Corp., Lansdale, Pa.; wrenches	1,558	steel castings	3,411	Boeing Aircraft Co., Seattle; airplanes and spare parts	337,447,058
St. Louis Steel Products Co., St. Louis; assemblies, arming wire	36,864	Air Associates, Inc., Bendix, N. J.; aircraft mooring kits	\$145,125	Bunell Machine & Tool Co., Cleveland; propeller and crank shaft parts	104,154
Wm. Schollhorn Co., New Haven, Conn.; pliers	61,819	Aircraft Accessories Corp., Kansas City, Kan.; propeller governor testing equipment	126,910	Cambridge Instrument Co., Inc., New York; fuel mixture indicator assemblies	359,879
Scovill Mfg. Co., Waterbury, Conn.; cups, case, cartridge brass	340,000	American Gas Accumulator Co., Elizabeth, N. J.; field lighting trucks	346,330	Douglas Aircraft Co., Inc., Santa Monica, Cal.; airplanes and spare parts	9,709,616
Scovill Mfg. Co., Inc., A. Schrader's Son Division, Brooklyn; gages	1,606	American Seating Co., Grand Rapids, Mich.; metal chairs	84,600	Fairchild Aviation Corp., Jamaica, N. Y.; finder assemblies	54,810
Sheffield Steel Corp., Kansas City, Mo.; forgings	600,000	Bendix Aviation Corp., Bendix Products Division, South Bend, Ind.; carburetors and spare parts	64,250	J. A. Fay & Egan Co., Cincinnati; woodworking machinery	
Sipp-Eastwood Corp., Paterson, N. J.; drilling machines	2,298				
Smalley-General Co., Bay City, Mich.; hobs for machine working tools	2,072				
Springfield Bronze & Aluminum Co., Springfield, Mass.; parts for guns	1,766				
Standard Gage Co., Inc., Poughkeepsie, N. Y.; gages	2,302				
Stanley Works, Stanley Tools Division, New Britain, Conn.; pin & center punches	19,233				
hammers	6,473				
Threadwell Tap & Die Co., Greenfield, Mass.; hard taps	1,960				
Thurston Mfg. Co., Providence, R. I.; cutting tools	1,045				
Timken-Detroit Axle Co., Wisconsin Axle Division, Oshkosh, Wis.; forks, collars, hubs and differential packings	4,880				
Torq Electric Mfg. Co., Cleveland; modernizing of motor drive attachments	4,928				
Union Twist Drill Co., Chicago; drills and countersinks	2,160				
tools	2,144				
cutting tools	7,236				
United Car Fastener Corp., Cambridge, Mass.; fasteners	5,220				
United States Machine Tool Co., Cincinnati; milling machines	1,880				
U. S. Tool & Mfg. Co., Dearborn, Mich.; milling cutters	1,572				
Veit & Young, Philadelphia; dies, stems and detectors	11,865				
Vimalert Co., Ltd., Jersey City, N. J.; parts for engines	461,219				
Wagner Malleable Iron Co., Decatur, Ill.; castings	2,064				
Wallace Supplies Mfg. Co., Chicago; assemblies	5,260				
Waltham Watch Co., Waltham, Mass.; fuse parts and escape-ment springs	63,715				
Warner Electric Brake Mfg. Co., Beloit; parts for guns and wire	1,570				
Watson-Stillman Co., Roselle, N. J.; covering & barricades for presses	7,413				
S. K. Wellman Co., Cleveland, Ohio; rivets, miscellaneous, and facings clutch, miscellaneous for tanks	16,645				
West Haven Foundry Co., West Haven, Conn.; hammers	16,550				
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.; bus distribution system & air circuit breakers	12,415				
Morris Wheeler Co., Philadelphia; beams, wide flange structural steel	2,105				
Wheeling Corrugating Co., Wheeling, W. Va.; end plates	30,006				
J. H. Williams & Co., New York; nuts, wing	3,121				
Wright Aeronautical Corp., Paterson, N. J.; parts for tool roll, parts for tanks	1,433				
E. H. Young & Son, Dayton, N. J.; gages	6,475				
Youngstown Sheet & Tube Co., Indiana Harbor, Ind.; steel rails	1,208				
	4,945				
	5,538				

KRANE KAR

**SWING BOOM
TRACTOR CRANE**

3 SIZES:

**2½, 5, & 10 Ton
Capacities**

11 to 31 Ft. Booms

**Solid Cushion
or Pneumatic
Tires**



*Handling 5-ton Steel Forgings at
Plant of Bethlehem Steel Co.,
Sparrows Point, Md.*

8 Points for Defense

- 1 VISION is unobstructed
- 2 BOOM TOPPING with full load
- 3 STABILITY without stabilizers
- 4 TRACTION INCREASED with load
- 5 AUTOMATIC BRAKES
- 6 EASY STEERING with load
- 7 SIMPLICITY of control
- 8 SAFETY under all conditions

Among the Users: Bethlehem Steel, Carnegie-Illinois Steel, American Steel & Wire, Keystone Steel & Wire, Otis Elevator, Wm. Sellers & Co., General Motors, Frost Gear and Forge, etc.

Write for Bulletin No. 55, with illustrations and specifications

SILENT HOIST WINCH & CRANE CO.
851 63rd ST., BROOKLYN, N.Y.

GOVERNMENT AWARDS

General Bronze Corp. , Long Island City, N. Y.; dolly assemblies, propellers	269,100	E. A. Kinsey Co. , Cincinnati; drill presses	87,634	stall heating plant, Wright Field, Dayton, Ohio	145,222
General Motors Corp. , Allison Division, Indianapolis; aircraft engines & spare parts	8,621,670	Leece-Neville Co. , Cleveland; maintenance parts for Leece-Neville type equipment	313,091	U. S. Electrical Motors, Inc. , Brooklyn; test stands	42,425
General Motors Corp. , Packard Electric Division, Warren, Ohio; aircraft power and lighting cable	58,006	Longines-Wittnauer Watch Co. , New York; clock assemblies	131,681		
General Electric Co. , Dayton, Ohio; position indicator assemblies	105,600	Master Electric Co. , Dayton, Ohio; electric generating plants	111,740		
C. H. Gosiger Machinery Co. , Dayton, Ohio; lathes, drill presses and woodworking machinery	451,154	R. D. Sheldon Co. , Cincinnati; woodworking machinery	24,650		
		Square D Co. , Kollsman Instrument Division, Elmhurst, N. Y.; compasses, remote indicating magnetic	330,000		
		L. E. Stevens Co. , Cincinnati; in-			



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SERVICE
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American Chain Link Machine Co. , Los Angeles; fencing materials	89,234
Anaconda Wire & Cable Co. , Marion, Ind.; cable for flood lighting system at Middletown Air Depot, Pa.	5,285
Aqua Systems, Inc. , New York; construction of gasoline fueling system	108,977
Baitinger Electric Co., Inc. , New York; parkway cable and tap boxes	7,039
Black & Decker Mfg. Co. , Towson, Md.; aircraft scales	3,200
Capitol Steel & Iron Co. , Oklahoma City; hangar door assemblies	98,000
Chicago Pneumatic Tool Co. , St. Louis; drills and pneumatic hammers	172,733
Clark Equipment Co. , Clark Tractor Division, Battle Creek, Mich.; tractors	2,785
James B. Clow & Sons , Chicago; cast iron water pipe, Scott Field, Ill., Air Corps Station	3,126
Fearless Dishwasher Co., Inc. , Rochester, N. Y.; dishwasher machines, Scott Field, Ill., Air Corps Station	8,585
Fuchs Machinery & Supply Co. , Omaha, Neb.; riveting hammers, surface plates, presses, grinders and sanders	22,829
Peter Gadd , Los Angeles; construction of Air Corps gasoline fueling system at Fresno Air Base, Fresno, Cal.	129,385
General Cable Corp. , Chicago; wire & cable, Scott Field, Ill., Air Corps Station	3,132
Graybar Electric Co., Inc. , St. Louis; hardware & accessories for electric lines at Jefferson Barracks, Mo., Air Corps Station	3,325
Greenfield Tap & Die Corp. , Greenfield, Mass.; pipe fittings	6,419
Groen Mfg. Co. , Chicago; kettles, steam jacketed, Lowry Field, Denver, Colo.	2,764
Charles E. Hayes Co. , Springfield, Mass.; electrical equipment	2,586
Hercules Mfg. Co. , Centerville, Iowa; bench tops at Aircraft Assembly Plant, Ft. Crook, Neb.	13,601
Hussmann-Ligonier Co. , St. Louis, Mo.; electric refrigerators at Jefferson Barracks, Mo., and Scott Field, Ill., Air Corps Station	2,570
Independent Electric Machinery Co. , Kansas City; portable motor-generator sets	2,187
Johns-Manville Sales Corp. , Dallas; transite pipe	57,757
Laclede Steel Co. , Madison, Ill.; steel, round bars, Scott Field, Ill., Air Corps Station	2,259
Layne Atlantic Co. , Norfolk, Va.; drilling wells	30,600
Machine Tool & Supply Co. , Tulsa, Okla.; "Cincinnati" Model, all steel sheer; steel press brake, Aircraft Assembly Plant, Tulsa, Okla.	11,046
Mosher Steel Co. , Dallas; structural steel	313,655
Nelsen Concrete Culvert Co. , East St. Louis, Ill.; sewer pipe & fittings at Scott Field, Ill., Air Corps Station	5,056
New Britain Machine Co. , New Britain, Conn.; legs & drawers	

GOVERNMENT AWARDS

for work benches, Aircraft Assembly Plant, Ft. Crook, Neb. . .			
Pacific States Cast Iron Pipe Co. , Los Angeles; pipe & pipe fittings at Salt Lake City, Utah, Airport	11,179	Defense Plant Building:	
Pratt & Whitney, Div. of Niles-Bement-Pond Co. , West Hartford, Conn.; vertical shaper with accessories, Aircraft Assembly Plant, Tulsa, Okla.	3,935	Bechtel-McCone-Parsons Corp. , Los Angeles; Missouri Ordnance Works, Louisiana, Mo. \$16,073,800	
Roberts Island Dredging & Improvement Co. , Pittsburgh, Cal.; furnishing & operating dredging plant at Suisun Bay & San Joaquin & Sacramento Rivers, Cal.	5,169	Douglas Aircraft Co., Inc. , Santa Monica, Cal.; facilities for mfr. of aircraft	522,170
Seeger Refrigerator Co. , St. Paul, Minn.; rivet coolers, Aircraft Assembly Plant, Tulsa, Okla. . .	32,947	Eureka Vacuum Cleaner Co. , Detroit; machinery and equipment for mfr. of hydraulic cylinders for aircraft	103,017
United States Pipe & Foundry Co. , Boston; cast iron pipe and fittings	8,350		
West Coast Construction Co. , Seattle; rails, ties	2,472		
War Dept., Quartermaster Corps:	5,340		
Autocar Co. , Ardmore, Pa.; tractor-trucks	2,876,975		
Callan Construction Co. , Bristol, R. I.; construction of coal storage facilities at Forts Getty, Kearny & Wetherill, R. I. . .	6,600		
Chrysler Corp. , Detroit; spare parts for 1½-ton trucks	238,513		
Delta Electric Co. , Marion, Ind.; 5000 ea. lanterns, electric	6,750		
Diamond T Motor Co. , Chicago; major assemblies	73,224		
Euro Bros. , Beaufort, N. C.; construction of garage, Nansemond Ordnance Depot, Va.	10,800		
Fargo Motor Corp. , Detroit; trucks, 1½-ton	2,809,561		
Ford Motor Co. , Detroit; 1½-ton trucks	29,620		
Highway Trailer Co. , Edgerton, Wis.; semi-trailers, 2-wheel . . .	553,383		
Henry W. Horst Co. , Philadelphia; construction of permanent engineering & automotive experiment laboratory building at Holabird QM Depot, Md.	468,500	● There has never been a time when the washing facilities for employees were being given as much consideration as they are now. Nor is there a country in the world that provides as modern, sanitary wash fixtures as are found in the plants of the U.S.A.	
International Harvester Co. , Fort Wayne, Ind.; trucks, 2½-ton . .	7,370	These fixtures, Bradley Washfountains, each accommodate 8 to 10 persons simultaneously with clean, running water from the central spray-head. Compared to individual wash basins for the same number of persons, the number of piping connections is reduced by 80 to 90 per cent, saving installation and maintenance expense.	
Lockwood Mfg. Co. , Cincinnati, Ohio; 20,000 ea. pans, bake sheet	7,140	Washroom Plan Booklet	
Marshall Co. , Dover, Ohio; construction of motor repair shops, Indiantown Gap Military Reservation, Pa.	94,672	To assist in modernizing washrooms—or planning washrooms for new buildings, Bradley Washroom Consultants are ready to make suggestions—and a copy of our booklet "Washroom Layouts" will be forwarded on request.	
Norfolk Southern Railroad Co. , Norfolk, Va.; construction of coal storage spur track, Camp Pendleton, Va.	1,749	BRADLEY WASHFOUNTAINS	
Skilken Brothers , Columbus, Ohio; construction of storage warehouse at Erie Proving Grounds, Ohio	1,642,621	TAIN CO. , 2239 W. Michigan Street, Milwaukee, Wisconsin.	
South Shore Contracting & Dredging Corp. , Patchogue, N. Y.; coal storage facilities at Camp Upton, N. Y.	26,400		
Oscar M. Stanley, Inc. , New York; construction of administration building, Nansemond Ordnance Depot, Va.	53,240		
Star Sprinkler Corp. , Philadelphia; installation of automatic sprinkler system, Camp Haan, Cal. . .	14,796	Bradley Washfountains in locker-shower room in new Foundry Employees' Service Building, Caterpillar Tractor Co., Peoria, Ill. Designed by Richard Belsterling and built by Fred Harbers' Sons, Contractor.	
United Fruit Co. , Boston, Mass.; steamer "Palo Seco"	75,000		
Yellow Truck & Coach Mfg. Co. , Pontiac, Mich.; trucks, 2½-ton. .	4,016,562		

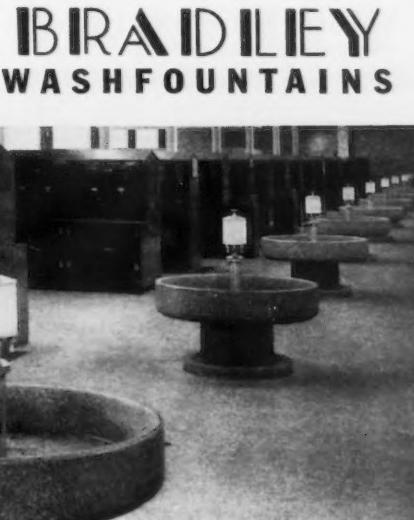
GROUP WASH FIXTURES SAVE SPACE

★ SAVE INSTALLATION TIME . . . PROVIDE MAXIMUM SANITATION



tion and maintenance expense.
Washroom Plan Booklet
To assist in modernizing washrooms—or planning washrooms for new buildings, Bradley Washroom Consultants are ready to make suggestions—and a copy of our booklet "Washroom Layouts" will be forwarded on request.

BRADLEY WASHFOUNTAINS



PERSONALS . . .

• **Coolidge Sherman** has been appointed Eastern sales manager, Allegheny Ludlum Steel Corp., Pittsburgh. In his new capacity Mr. Sherman will act as coordinator of sales in all districts of the Eastern seaboard. Mr. Sherman has been associated with the company since his graduation from Yale University in 1916, at which time he began working for the Ludlum Steel Co. From 1922 to 1930 he served as sales manager of Ludlum's Cleveland district. From 1930 until the merger of the Allegheny and Ludlum steel companies in 1938, he was assistant to the president in the latter organization. Up to the time of his present appointment, he was manager of valve steel sales for Allegheny Ludlum.

• **Daniel Simonds** has been made chairman of the board, and **Gifford K. Simonds, Jr.**, general manager, of the Simonds Saw & Steel Co., Fitchburg, Mass. Mr. Simonds, Jr., is a cousin of Daniel Simonds.

• **Gus M. Hess**, who joined the Armstrong-Blum Mfg. Co., Chicago, in 1929, has been appointed general sales manager. He has been Eastern sales manager since 1935. **Ted A. Slezak**, formerly connected with the machinery division of Joseph T. Ryerson & Son, has been made Eastern sales manager of the Armstrong-Blum company. He covered the Chicago territory for Ryerson for a number of years and was put in charge of machinery sales in the East early in 1940.

• **Donald G. Dunn**, sales promotion and advertising manager of Reynolds Metals Co., New York, has been appointed assistant to **J. Louis Reynolds**, vice-president and general sales manager of the company. He has been associated with the company since 1938.

• **John W. Bates** has been appointed assistant to the general superintendent of the Homestead, Pa., works of Carnegie-Illinois Steel Corp. Formerly superintendent of the Irvin works 80-in. hot strip mill, Mr. Bates has been associated with the United States Steel Corp. subsidiaries for 14 years.



COOLIDGE SHERMAN, Eastern sales manager of Allegheny Ludlum Steel Corp.

• **William K. Cusick** has resigned his position with the Parker Rustproof Co., Detroit, to take charge of engineering and sales work for the IRCO zinc coat division of International Rustproof Corp. of Cleveland. Mr. Cusick is a graduate of Ohio State University in chemical engineering.



JOHN P. DEBRI, new general superintendent of the Joliet works of American Steel & Wire Co., whose appointment was noted in these columns last week.

• **A. A. Browne**, for the past two years steam engineer for the entire Pacific Coast district for Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has been made assistant manager of that district's central station and transportation divisions.

• **Courtney Johnson**, assistant sales manager of the Studebaker passenger car division, has been transferred to the Washington office of the Studebaker Corp., and will concentrate his efforts on the company's defense activities.

• **Dr. Willard H. Dow**, president and general manager of the Dow Chemical Co., Midland, Mich., has been elected chairman of the board of directors to succeed **Dr. James T. Pardee**, who has resigned after 47 years as a director and seven as chairman of the board. Dr. Pardee has been named chairman emeritus. **G. E. Collings**, of Cleveland, who was vice-president emeritus, also has resigned from the board. Two new directors subsequently have been named. They are **Alden B. Dow**, Midland architect and brother of Dr. Dow, and **Mark E. Putnam**, production manager. **Dr. E. O. Barstow** and **Dr. Charles J. Strosacker** have been named vice-presidents. **Leland I. Doan**, vice-president and general sales manager, has been made secretary, a post formerly held by **Earl W. Bennett**, who retains his offices as vice-president and treasurer.

• **Ernest Sault**, assistant to the general purchasing agent of American Brake Shoe & Foundry Co., New York, was given a luncheon in New York on Sept. 4 by **William B. Given, Jr.**, president, to honor the 40th anniversary of his connection with the company.

• **Maj. James H. Doolittle**, assistant chief of the Army Air Corps Central Procurement District with offices in Detroit, has been sent abroad for a tour of African, Near-East, Mediterranean and Atlantic battle fronts. Major Doolittle is on leave of absence from Shell Oil Co. and has been engaged in special liaison work with the automotive industry for nearly a year for the Army Air Corps.

• **Harry E. Huff**, assistant manager of the Empire division of the Mazda lamp department of the General Electric Co., Schenectady, N. Y., has been promoted to manager of the division, with offices in Buffalo. He succeeds **Edward F. Strong**, who has resigned.

• **Eugene E. Everett**, formerly with the Muncie Gear Works as a process engineer and metallurgist, has joined the A. F. Holden Co., New Haven, Conn., in the same capacity.

• **Paul G. Cheatham, Jr.**, has been appointed representative in Mexico, with headquarters in Mexico City, for Iron & Steel Products, Inc., Chicago.

• **Elmer D. Heinz** has been made secretary of the Niagara Machine & Tool Works, Buffalo.

• **Dean R. Wilson** has been appointed purchasing agent of the Warren, Ohio, plant of Copperweld Steel Co., Glassport, Pa. He was formerly vice-president of Carbon Steel Co. and president of the Anchor Drawn Steel Co.

• **H. E. Boedecker** has been made superintendent of electrical and mechanical departments, Atlas Steels, Ltd., Welland, Canada. He formerly was superintendent of maintenance, Crucible Steel Co. of America, Pittsburgh. Mr. Boedecker first entered the steel industry in the tube mill electrical department of La Belle Iron works, now part of the Wheeling Steel Corp. After brief periods at the Farrell works of Carnegie Steel Co. and Middletown plant of American Rolling Mill Co., he became connected with Tennessee Coal, Iron & Railroad Co. After two years in the electrical department of Wisconsin Steel Co. and two years in electrical construction with Jones & Laughlin Steel Corp., Mr. Boedecker joined the Crucible Steel Co. of America where he remained for 15 years.

• **William G. Crook**, heretofore of the Boston office of Carnegie-Illinois Steel Corp., has been appointed assistant manager of sales in charge of the Buffalo office of Carnegie-Illinois. He entered the steel industry in the Boston sales office of the company in 1917.

• **Paul F. Vander Lippe**, since 1935 resident salesman in the

Tulsa office for Carnegie-Illinois, has been made assistant to the manager of sales in charge of the Kansas City office. He began his business career at the St. Louis district sales office of the former Carnegie Steel Co. in 1911.

• **Leigh E. St. John**, heretofore assistant plant engineer of International Business Machines Corp., Endicott, N. Y., has been promoted to plant engineer. He is a graduate of Rensselaer Polytechnic Institute and has a wide background of industrial engineering

experience. **Samuel E. Lenox** has been made supervisor of the planning department at Endicott, and **Henry J. Jamieson** has been promoted to assistant planning supervisor. **Earl F. Gilliam**, who joined the company as a serviceman in 1923, has been made supervisor of inspection.

• **Edward A. France**, OPA scrap division, has resigned to resume his former position about Oct. 1 as field analyst for Standard Statistics Co., Inc., Cleveland.

OBITUARY...

• **Charles L. Fortinberry**, formerly manager of the Auto stop division of Evans Products Co., Detroit, died recently at the age of 42. He had been a resident of Detroit for the past three years. At the time of his death he was director of sales promotion for the Prismo Safety Corp., Huntington, Pa.

• **Edward M. Taggart**, president of Taggart & Co., Philadelphia, died recently at his home in East Orange, N. J., at the age of 76. Mr.

Taggart had been active in the foundry industry in the East for the past 35 years.

• **Charles E. Baisley**, distinguished ship builder and tunnel builder, died recently. He was 76 years old at the time of his death. His first employment in a ship building concern was in 1882, when he started as an apprentice at the old Detroit Drydock Shipyard, Wyandotte, Mich. Twenty-five years later he became manager of the St. Clair yard of the Great Lakes Engineering Works of River Rouge, Mich. In this capacity he supervised construction of the Michigan Central Railroad tunnel under the Detroit River, which was fabricated in the St. Clair yards in 250-ft. sections. Mr. Baisley was manager of the Great Lakes Engineering Works until his retirement on Jan. 1.

• **Charles A. Stillman**, president of the Goodyear Tire & Rubber Co., died at Akron, Ohio, on Sept. 6 aged 68 years. An officer of Goodyear for 20 years, he supervised the establishment of plants in Gadsden, Ala., South America, Australia, England and Sweden.

• **Harold Osborne**, general manager and assistant vice-president of the United Shoe Machinery Co., Boston, died Sept. 7.

• **William F. Drake**, 50 years of age, president and treasurer of the Advance Sheet Metal & Furnace Co., Milwaukee, died Sept. 7, in a hospital there after a long illness.



THE LATE A. B. CHARLTON, manager of the Alameda works of Bethlehem Fabricated Steel Construction division, an account of whose career was published in these columns last week.

CONSTRUCTION STEEL

... STRUCTURAL STEEL, REINFORCING BARS, PLATES, PILING, ETC.

Fabricated Steel

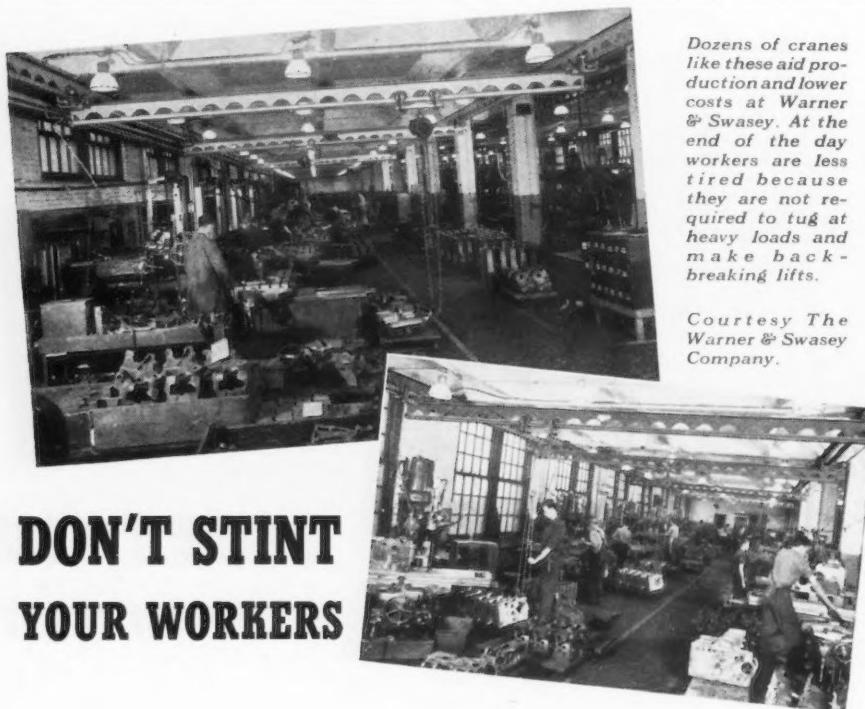
Lettings drop to 15,600 tons from 19,850 tons last week; new projects higher at 27,250 tons; plate awards call for 2100 tons.

AWARDS

NORTH ATLANTIC STATES

7040 Tons, Brooklyn Navy Yard, sub-assembly shop, to Bethlehem Steel Co., Bethlehem, Pa.

- 1360 Tons**, Tonawanda, N. Y., aviation engine plant No. 1 for Chevrolet Motor Co., to Bethlehem Steel Co., Bethlehem, Pa.
- 650 Tons**, Philadelphia, Pier shed on Delaware River, to Bethlehem Steel Co., Bethlehem, Pa.
- 360 Tons**, Norwich, N. Y., grade crossing elimination, to American Bridge Co., Pittsburgh, through Lane Construction Co., Meriden, Conn.
- 350 Tons**, Fort Hancock, N. J., requirements, to American Bridge Co., Pittsburgh.
- 315 Tons**, Bradford County, Pa., highway project, to Phoenix Bridge Co., Phoenixville, Pa.



DON'T STINT YOUR WORKERS

Most men want to keep busy and will if given the necessary equipment. But in many shops much of the valuable time of skilled mechanics is lost because of insufficient materials handling equipment. They have to spend a good part of their time waiting for crane service.

Hand-propelled cranes, illustrated above, are not expensive. In fact, most installations usually pay for themselves in a surprisingly short time. And workers are not stinted — they are not forced to cease producing because of lack of materials handling equipment.

Cleveland Tramrail can help you as it has thousands of others. Why not investigate the possibilities of this equipment now? Write for illustrated booklet 2004-A.

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THE CLEVELAND CRANE & ENGINEERING CO.
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CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT
Other products: CLEVELAND CRANES and STEELWELD MACHINERY

- 165 Tons**, Blackhall, Conn., bridge, New York, New Haven & Hartford Railroad, to American Bridge Co., Pittsburgh.
- 125 Tons**, beans, crane runway, South Portland Shipbuilding Co., South Portland, Me., to American Bridge Co., Pittsburgh.

THE SOUTH

- 866 Tons**, Raleigh, N. C., state armory for North Carolina, to Ingalls Iron Works Co., Birmingham.
- 400 Tons**, Desda, Ky., Wolk Creek tail tower and anchorages for government, to American Bridge Co., Pittsburgh.

CENTRAL STATES

- 1390 Tons**, Illinois, State bridge over Grand Detour River, to Bethlehem Steel Co., Bethlehem, Pa.
- 900 Tons**, Alliance, Ohio, foundry buildings for American Steel Foundries, to American Bridge Co., Pittsburgh.
- 520 Tons**, Fort Crook, Neb., paint shop for U. S. Engineer's office, War Department, to Omaha Steel Works, Omaha, Neb.
- 500 Tons**, Milwaukee, Wis., building, Bucyrus-Erie, to Worden-Allen Co., Milwaukee.
- 412 Tons**, Austin, Ind., State highway bridge, to Vincennes Bridge Co., Vincennes, Ind.

WESTERN STATES

- 200 Tons**, Portland, Ore., Bonneville transmission towers, Willamette River crossing No. 2 (Invitation 2116), to Bethlehem Steel Co., San Francisco.

PENDING STRUCTURAL STEEL PROJECTS NORTH ATLANTIC STATES

- 11,000 Tons**, Pottstown, Pa., aircraft engine plant for Jacobs Aircraft Engine Co.
- 2700 Tons**, Bellevue, D. C., storehouse, Naval magazine, Rust Engineering Co., Pittsburgh, low bidder.
- 2500 Tons**, Washington, central heating plant for government.
- 2300 Tons**, Philadelphia Navy Yard bridge, Phoenix Bridge Co., Phoenixville, Pa., low bidder.
- 1600 Tons**, Philadelphia, runway for overhead cranes, dry dock No. 5, for Navy.
- 400 Tons**, Midvale, Pa., machine shop: bids taken Sept. 17.
- 300 Tons**, Pittsburgh, Glen Hazel project, for Pittsburgh Housing Authority.
- 300 Tons**, Williamsburg, N. Y., Sisters of St. Francis, home for aged.
- 245 Tons**, Albany, N. Y., building for B. P. Barrett, Inc.
- 215 Tons**, Naugatuck, Conn., building for Defense Plant Corp.
- 200 Tons**, Lynn, Mass., Lynn Gas & Electric Co., power plant.
- 180 Tons**, Brooklyn Navy Yard, material storage racks, building No. 77.
- 140 Tons**, Lock Haven, Pa., addition for Piper Aircraft Co.
- 130 Tons**, Errol, N. H., Androscoggin River State bridge.
- 115 Tons**, New York, mortuary building for Queens General Hospital.

THE SOUTH

- 2500 Tons**, Fairmont, W. Va., gas plant building D for Westinghouse Electric & Mfg. Co.
- 1400 Tons**, Norfolk, Va., building on pier No. 3 for Navy Department.
- 775 Tons**, Dallas, Tex., plant for Guiberson Diesel Engine Co.; bids in.
- 225 Tons**, Appalachia project, towers and girder end supports for TVA construction trestle.

CENTRAL STATES

- 806 Tons**, Struthers, Ohio, railroad bridge for Youngstown Sheet & Tube Co.
- 406 Tons**, Hamilton County, Ohio, State project; Visentine & Co., Columbus, low bidders on general contract.
- 310 Tons**, Illinois and Iowa, bridges for Chicago Great Western Railway.
- 140 Tons**, Great Lakes, Ill., Chapel theatre for Navy.

WESTERN STATES

- 1500 Tons**, Seattle, Isaacson Iron Works plant addition.
- 260 Tons**, Santa Margarita, Cal., drum gate, Salinas River project, for Army.
- 200 Tons**, Seattle, Army quartermaster's warehouse on East Marginal Way.

CONSTRUCTION STEEL

180 Tons, Seattle, Army Quartermaster Pier B.

FABRICATED PLATES AWARDS

1700 Tons, New Orleans, four all-welded cargo barges for War Department, to Ingalls Shipbuilding Corp., Decatur, Ala., shipyard.

480 Tons, Philadelphia, 48-in. pipe for city water main, to Bethlehem Steel Co., Bethlehem, Pa.

PENDING PROJECTS

300 Tons, Portsmouth, N. H., 54-in. pipe line for Navy Yard.

300 Tons, Boston 24-in. pipe line for Metropolitan Water District.

Pipe Lines

• Rock Island Refining Co., Duncan, Okla., has approved plans for new 6-in. welded steel pipe line from Cement, Okla., oil field district to Marlow, Okla., about 30 miles, for crude oil transmission. Connection will be made with company pumping station at last noted place. Construction will be carried out with company forces. Cost close to \$100,000.

General Purchasing Officer, Panama Canal, Washington, asks bids until Sept. 26 for welded steel pipe; also for galvanized steel pipe (Schedule 5516).

United States Engineer Office, Park Square Building, Boston, has let contract to Ley Construction Co., 1215 Main Street, Springfield, Mass., at \$92,242, for pipe line system for gasoline distribution at Army Air Base, Houlton, Me., including bulk station and fueling facilities.

Arkansas-Louisiana Gas Co., 300 West Capitol Street, Little Rock, Ark., has begun work on 10 and 16-in. welded steel pipe line from connection with main gas transmission line to Clarksville, Ark., about eight miles, for natural gas transmission to latter place, where service will be furnished. Cost close to \$100,000 with distribution facilities.

Oklahoma Natural Gas Co., 624 South Boston Street, Tulsa, Okla., has let contract to E. M. Campbell & Co., 116 North Denver Street, Tulsa, for 16-in. welded steel pipe line from gas field near Cement, Okla., to connection with main pipe line system, for natural gas transmission; also for extensions and improvements in present lines. Cost over \$200,000. Company is arranging for acquisition of properties of Central States Power & Light Co., in Oklahoma, furnishing natural gas service at Stillwater, Henryetta, Oilton, Pawnee, Wetumka, Jennings and neighboring communities, consisting of 10 pipe line systems in all, six located in east-central part of State, three in north-central section and one in western district. Extensions and improvements are planned, including pipe lines for connection with main system.

Cast Iron Pipe

• Medina, Ohio, plans pipe line extensions in water system and other waterworks installation. Cost about \$65,000.

Choteau, Okla., plans pipe line extensions and replacements in water system and other waterworks installation; also additions in sewer system. Entire project will cost about \$300,000. Financing is being arranged through Federal aid.

Pulaski, Va., plans extensions and replacements in water pipe line system and other waterworks installation. Cost close to \$600,000. Financing is being arranged through Federal aid. Wiley & Wilson, Peoples' National Bank Building, Lynchburg, Va., are consulting engineers.

Galveston County Water Control and Improvement District No. 3, Galveston, Tex., plans pipe lines for water system and other waterworks installation, including pumping station, elevated steel tank and tower, etc. Cost about \$140,000. Financing is being arranged through Federal aid. Joseph J. Rady,

Weekly Bookings of Construction Steel

Week Ended	Year to Date					
	Sept. 16, 1941	Sept. 9, 1941	Aug. 19, 1941	Sept. 17, 1940	1941	1940
Fabricated structural steel awards	15,600	19,850	23,235	25,500	1,000,795	703,835
Fabricated plate awards	2,100	265	1,300	1,390	99,010	112,705
Sheet steel piling awards	0	0	0	2,640	20,760	36,040
Reinforcing bar awards	10,310	53,345	15,590	4,410	528,850	340,025
Total letting of Construction Steel	28,010	73,460	40,125	33,940	1,649,415	1,192,605

Majestic Building, Fort Worth, Tex., is consulting engineer.

Henrico County Board, Richmond, Va., S.

J. Mahaffey, county manager, plans water pipe line system in Lakeside district. Cost about \$50,000.

**"I WANT THE BEST
POSSIBLE JOB -
I MUST HAVE A
GOOD OIL!!"**

"THAT'S WHY I CALLED THE CITIES SERVICE LUBRICATION MAN IN" SAYS A. E. DAVEY, PRESIDENT OF ALLOY STEEL GEAR AND PINION COMPANY OF CHICAGO.

"I'm doing a job here that must be perfect when it leaves the shop. The people who get the gears are plenty critical." Mr. Davey says further, "I don't know everything about oil. That is why I called in the Cities Service Lubrication man. I expect him to work with my men to see that they get the oil best suited for the job."

Much work in this shop must meet rigid government inspection.



A. E. Davey

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CONSTRUCTION STEEL

Reinforcing Steel

Awards of 10,310 tons; 20,780 tons in new projects.

AWARDS

ATLANTIC STATES

- 1400 Tons, Rome, N. Y., Army Air Corps depot, to Bethlehem Steel Co., Bethlehem, Pa.; Turner Construction Co., contractor.
- 1200 Tons, Marietta, Pa., Army supply depot, to Sweets Steel Co., Williamsport, Pa.; Brann & Stuart, contractors.
- 400 Tons, Salem, Mass., Boston & Maine Railroad overpass, to Northern Steel Co., Boston.

SOUTH AND CENTRAL

- 1000 Tons, Dearborn, Mich., foundry building, Ford Motor Co.; Ford furnishes own concrete bars.

800 Tons, Grassmere, Ala., building for E. I. du Pont de Nemours & Co., to Truscon Steel Co., Youngstown.

550 Tons, Wichita, Kan., bomber plant, to Colorado Fuel & Iron Co., Denver.

250 Tons, Norfolk, Va., Yorktown Mine depot, additional requirements, to Bethlehem Steel Co., Bethlehem, Pa.; Virginia Engineering Co., contractor.

150 Tons, Royal Oak, Mich., Michigan Bell Telephone Co. building, to Taylor & Gaskin, Inc., Detroit; O. W. Burke, contractor.

115 Tons, Bay City, Mich., manufacturing building for Chevrolet Motor Co., to Truscon Steel Co., through Henry C. Weber Construction Co., contractor.

WESTERN STATES

- 2800 Tons, San Pedro-Long Beach, Cal., Navy hospital, to Soule Steel Co., Los Angeles, through R. E. Campbell, Los Angeles, contractor.

1000 Tons, Santa Maria-Lompoc, Cal., Army cantonment, armored division, to Ceco Steel Products Co., Los Angeles, through McDonald & Kahn & J. F. Shea, San Francisco and Los Angeles, contractors.

343 Tons, Tacoma, Wash., Indian hospital, to Truscon Steel Co., Youngstown, Ohio, through L. H. Hoffman, Portland, Ore., contractor.

300 Tons, San Diego, Naval training station barracks and storehouse, to Truscon Steel Co., Los Angeles, through James I. Barnes, Santa Monica, Cal., contractor.

PENDING REINFORCING BAR PROJECTS

ATLANTIC STATES

- 2300 Tons, Portsmouth, N. H., Navy Yard graving dock; Aberthaw Construction Co., contractor.

1500 Tons, Massena, N. Y., plant for Aluminum Co. of America.

700 Tons, New York, Battery-Brooklyn tunnel, contract No. 7.

470 Tons, Lester, Pa., defense products plant, Westinghouse Electric & Mfg. Co.

450 Tons, Washington, Hecht Co. warehouse.

300 Tons, Newport, R. I., Naval training station boiler house; Ford, Beacon & Davis, contractors.

300 Tons, Long Island City, N. Y., Pepsi-Cola building.

200 Tons, Latrobe, Pa., Stupakoff Mfg. Co. plant.

100 Tons, Newport, R. I., government wharf.

CENTRAL STATES

4400 Tons, Terre Haute, Ind., smokeless powder plant.

600 Tons, Little Rock, Ark., Camp Barling cantonment.

600 Tons, Waterlow, Wis., Rath Packing Co., four buildings.

300 Tons, Maroa, Ill., grain bins.

300 Tons, St. Louis, plant and offices, American Can Co.; Norris Construction Co., contractor.

250 Tons, Cleveland, building for Champion Machine & Forging Co.; Sam W. Emerson Co., general contractor; bids in.

200 Tons, Dancy, Wis., Consolidated Power & Paper Co.

150 Tons, Milwaukee, airplane engine plant.

100 Tons, Waupon, Wis., National Rivet Co.

WESTERN STATES

2120 Tons, Mecca, Cal., All-American Canal (Invitation C-42,230-A); bids taken.

2000 Tons, Seattle, Army Quartermaster Pier B; construction bids in.

1000 Tons, Renton, Wash., Boeing Aircraft plant.

817 Tons, Odair, Wash., Grand Coulee power plant (Invitation D-38,091-A); bids in.

654 Tons, Mecca, Cal., reinforcing mesh, All-American Canal (Invitation C-42,220-A-1); Colorado Fuel & Iron Corp., Denver, only bidder on schedule 1, no bids received on schedule 2.

347 Tons, Araby, Ariz., Yuma-Mesa division, Gila project (Invitation 24,851-A); bids in.

224 Tons, Annette Island, Alaska, Army work (United States Engineer, Seattle, Invitation 65); bids in.

223 Tons, Fort Richardson, Alaska Army work (United States Engineer, Seattle, Invitations 59 and 60); bids in.

165 Tons, Fairbanks, Alaska, Army work (United States Engineer, Seattle, Invitation 64); bids in.

150 Tons, Odair, Wash., Grand Coulee power plant (Invitation 38,028-A-1).

103 Tons, Fort Richardson, Anchorage, Alaska, and Ladd Field, Fairbanks, Alaska, Army work (United States Engineer, Seattle, Invitation 70); bids in.

Bransome, Vanadium Corp.

President, Leaves OPM

• • • **OPM Associate Director** General Sidney Hillman announced on Saturday that E. D. Bransome has resigned from his position as head of the Industrial Advisors panel in the Labor Relations Branch of OPM's Labor Division, to return to his post as president of the Vanadium Corp.



No. 10 RADIAGRAPHS RIDE SMOOTHLY ON

TORRINGTON NEEDLE BEARINGS



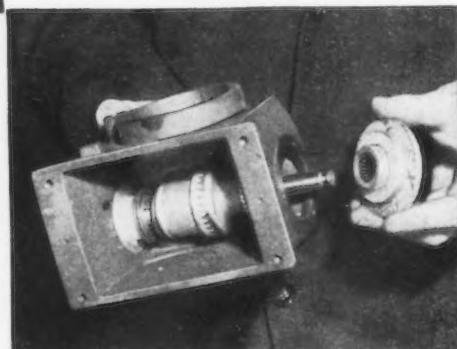
ANTI-FRICTION TORRINGTON NEEDLE BEARINGS

BEARINGS, on the driving wheel assembly of Airco No. 10 Radiographs, help assure efficient operation of these gas-cutting machines, used for making smooth, clean cuts and bevels in steel. "Torrington Needle Bearings insure ample bearing lubrication for long periods after installation and insure long bearing life," say Air Reduction engineers.



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BEARINGS helps reduce size and weight of surrounding parts. They give low coefficient of friction, yet occupy no more space than plain bushings. The Needle Bearing units are installed by a quick, simple press fit on an ordinary arbor press. Both initial and installation costs are surprisingly low.



Your product, too, may be improved by the unusual features and economies of the Torrington Needle Bearing. Our Engineering Department will be glad to assist you in planning its use. For full information write for Catalog No. 104. For Needle Bearings to be used in heavier service, write our affiliate, Bantam Bearings Corporation, South Bend, Indiana, for Booklet 104X.



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Makers of Needle and Ball Bearings

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TORRINGTON NEEDLE BEARING

Semi-Finished Output for Export Up 24% in July

• • • Sharply increased rolling of semi-finished steel for export boosted production of iron and steel products in July some 24 per cent over the June total, according to data on production for sale of iron and steel products issued by the American Iron & Steel Institute. Production for export in

July totaled 430,493 tons (see table below), as compared with 327,357 tons in June. Chief cause for this rise of 103,136 tons was the jump in output for export of ingots, blooms, billets, slabs, etc., to 169,575 tons in July.

Total output of all steel produced for sale in July was 5,226,-

102 tons, or 98.9 per cent of capacity, as compared with 5,086,210 tons or 100.4 per cent in June. The generally lower rate of output was reflected fairly evenly in all the product classifications. As yet the conversion of sheet mills to plate production has not had any notable effect upon sheet production.

AMERICAN IRON AND STEEL INSTITUTE Capacity and Production for Sale of Iron and Steel Products										July - 1941			
STEEL PRODUCTS	Number of Companies	Total Annual Capacity Net tons	PRODUCTION FOR SALE—NET TONS						Year to Date				
			Current Month			Shipments			Year to Date			Shipments	
			Total	Per cent of capacity	Export	To members of the industry for con- version into further finished products	Total	Per cent of capacity	Export	To members of the industry for con- version into further finished products	Export	To members of the industry for con- version into further finished products	
Ingots, blooms, billets, slabs, sheet bars, etc.	35	1	548,025	xxx	169,575	153,493	3,487,232	xxx	850,424	1,094,346			
Heavy structural shapes	8	2	4,948,200	87.3	10,858	xxxxxx	2,568,638	89.4	102,414	xxxxxx			
Steel piling	4	3	422,000	27.288	76.4	3,170	204,583	83.5	17,956	xxxxxx			
Plates—Sheared and Universal	19	4	6,294,590	483,238	90.6	17,545	896	3,198,840	87.5	216,633	14,194		
Skelp	8	5	xxxxxx	81,169	***	10,435	34,133	611,115	***	102,312	250,927		
Rails—Standard (over 60 lbs.)	4	6	3,613,600	134,699	44.0	1,361	xxxxxx	1,068,394	50.9	45,716	xxxxxx		
Light (60 lbs. and under)	6	7	302,800	13,508	52.6	5,432	xxxxxx	106,604	60.6	39,246	xxxxxx		
All other (Incl. girder, guard, etc.)	2	8	102,000	2,885	33.4	193	xxxxxx	15,919	26.9	2,051	xxxxxx		
Splice bar and tie plates	15	9	1,300,200	54,000	49.0	907	xxxxxx	442,558	58.6	10,570	xxxxxx		
Bars—Merchant	35	10	495,210	xxx	23,105	52,446	3,677,933	xxx	299,544	409,326			
Concrete reinforcing—New billet	16	11	127,578	xxx	11,544	xxxxxx	844,408	xxx	122,853	xxxxxx			
Rerolling	17	12	15,421	xxx	1,297	xxxxxx	104,680	xxx	7,980	xxxxxx			
Cold finished—Carbon	10	13	94,645	xxx	2,230	xxxxxx	702,327	xxx	13,051	xxxxxx			
Alloy—Hot rolled	16	14	142,110	xxx	9,100	8,895	975,829	xxx	83,171	24,677			
Cold finished	16	15	17,946	xxx	955	xxxxxx	113,728	xxx	12,294	xxxxxx			
Hoops and baling bands	5	16	10,923	xxx	104	xxxxxx	65,663	xxx	2,340	xxxxxx			
TOTAL BARS	53	17	12,217,285	903,833	87.3	48,635	61,341	6,482,568	91.3	541,233	494,003		
Tool steel bars (rolled and forged)	16	18	128,920	11,424	104.5	635	xxxxxx	67,093	88.6	4,556	xxxxxx		
Pipe and tube—B. W.	13	19	2,049,200	136,931	78.8	8,931	xxxxxx	901,664	75.7	71,460	xxxxxx		
L. W.	8	20	885,260	44,836	59.7	2,554	xxxxxx	289,056	55.4	19,124	xxxxxx		
Electric weld	4	21	466,020	53,910	136.5	630	xxxxxx	276,889	102.3	13,242	xxxxxx		
Seamless	15	22	3,003,840	193,310	75.9	12,674	xxxxxx	1,237,106	70.9	118,486	xxxxxx		
Conduit	6	23	152,145	12,304	95.4	277	xxxxxx	80,754	91.4	1,466	xxxxxx		
Mechanical Tubing	12	24	516,725	38,773	88.5	3,391	xxxxxx	272,407	90.7	25,283	xxxxxx		
Wire rods	19	25	120,027	xxx	13,105	19,993	875,127	xxx	94,016	149,015			
Wire—Drawn	37	26	2,291,250	189,019	97.3	11,157	1,501	1,289,278	96.9	90,560	12,556		
Nails and staples	18	27	1,120,330	61,561	64.8	6,440	xxxxxx	473,468	72.7	44,133	xxxxxx		
Barbed and twisted	16	28	458,210	22,257	57.3	4,409	xxxxxx	164,728	61.9	37,129	xxxxxx		
Woven wire fence	15	29	746,180	24,516	38.8	139	xxxxxx	193,277	44.6	1,251	xxxxxx		
Bale ties	11	30	110,980	7,720	82.1	42	xxxxxx	48,361	75.0	141	xxxxxx		
All other wire products	5	31	24,280	509	24.7	-	xxxxxx	3,157	26.6	-	xxxxxx		
Fence posts	13	32	136,195	7,365	63.8	61	xxxxxx	44,365	56.1	595	xxxxxx		
Black plate	11	33	341,235	40,823	141.1	6,588	-	243,882	123.0	23,245	43-		
Tin plate—Hot rolled	7	34	352,700	31,586	105.6	7,964	xxxxxx	169,887	82.9	17,842	xxxxxx		
Cold reduced	10	35	3,520,640	300,498	100.7	33,044	xxxxxx	1,672,473	81.8	153,828	xxxxxx		
Sheets—Hot rolled	24	36	583,402	xxx	25,015	17,124	4,398,972	xxx	185,221	129,543			
Galvanized	14	37	120,864	7,889	xxx	1,001,541	xxx	70,824	xxx		xxxxxx		
Cold rolled	16	38	244,726	6,186	xxx	1,897,387	xxx	41,771	xxx		xxxxxx		
All other	14	39	59,506	2,082	xxx	466,487	xxx	13,708	xxx		xxxxxx		
TOTAL SHEETS	27	40	13,154,510	1,008,498	90.4	41,172	17,124	7,764,487	101.6	311,524	129,543		
Strip—Hot rolled	23	41	3,200,380	155,565	57.3	6,515	19,011	1,192,933	64.2	46,666	153,271		
Cold rolled	34	42	1,385,260	99,222	84.5	1,352	xxxxxx	700,909	87.1	10,656	xxxxxx		
Wheels (car. rolled steel)	5	43	422,825	19,547	54.5	138	xxxxxx	146,685	59.7	437	xxxxxx		
Axles	4	44	172,280	16,561	41.4	207	xxxxxx	102,672	37.4	1,581	xxxxxx		
Track spikes	11	45	327,275	13,058	47.1	357	xxxxxx	103,129	54.2	2,025	xxxxxx		
All other	4	46	24,100	1,451	71.0	-	xxxxxx	12,852	91.3	79	xxxxxx		
TOTAL STEEL PRODUCTS (a)	134	47	5,226,102	430,493	307,492	-	36,509,630	xxx	3,017,880	2,297,888			

IRON PRODUCERS

Pig iron, ferro manganese and spiegel	24	48	xxxxxx	665,037	xxx	35,706	207,802	4,458,198	xxx	316,463	1,352,794
Ingot moulds	4	49	xxxxxx	66,665	xxx	374	xxxxxx	429,704	xxx	2,305	xxxxxx
Bars	9	50	109,195	6,361	68.7	8	512	39,195	61.3	28	2,548
Pipe and tubes	3	51	109,300	5,667	61.2	357	xxxxxx	38,123	60.0	1,561	xxxxxx
All other	2	52	71,000	2,100	34.9	11	-	11,349	27.5	1,680	-
TOTAL IRON PRODUCTS (ITEMS 50 to 52)	11	53	224,995	14,128	74.1	376	512	88,665	67.8	3,269	2,548

Total Number of Companies
Included - 151

(a) Reported by Companies which in 1940 produced 96.5% of that year's total output of Finished Rolled Products.

The estimated average yield of products for sale from ingots produced by the companies included above is 71.1%, which applied to their total ingot capacity equals 58,680,500 net tons of finished rolled products. Production for sale, less shipments to members of the industry for further conversion, related to the estimated yield is as follows:

Current month	4,918,610 N.T.	98.9%
Year to date	34,211,732 N.T.	102.0%

MACHINE TOOLS

... SALES, INQUIRIES AND MARKET NEWS

Used Machinery Offered In Greater Volume

Cleveland

• • • Despite the intense usage of old machinery, an increasingly surprising development has been the growing offerings of such used machinery as indicated by advertisements in various trade journals. Although the reason for this is not too clear, it appears to be a combination of a number of varying circumstances. One such trend has been the worsening predicament of non-defense plants, whose decreasing activity enables them to market a portion of their almost obsolete equipment. On the other hand, since defense plants have been able to get new equipment quite promptly with the aid of their high priority ratings, many of them are able to discard some of their old non-defense machinery, in some cases to make

room for new equipment. Of course, there has been a general trend toward cleaning out old equipment not being used by American industry as a whole in view of the comparatively favorable prices that may be obtained at present.

Some buyers of second hand machinery were of the opinion that they could easily secure new parts to permit a fairly effective overhauling of such machinery. Of course, when they discover the necessity for priority ratings in order to secure machinery parts, they frequently decide to place the machine upon the market again. On the other hand, parts suppliers have noted that their replacement order lists have been growing larger and larger. In some cases it would appear that practically all the parts of an old machine are to be replaced except the machine base and the housing. Since the parts business returns favorable

profit margins to the industry, the increased demand is highly welcomed.

The bids for 500 new machines asked by Apex Electric Co. have been increased in number to 600 during the past week. It is understood that at least 300 of these small precision machine tools are for immediate delivery. In view of the fact that Apex will enjoy a high rating on the basis of the defense subcontracts it has received from the Ford Instrument Co., no trouble is expected to be encountered in making such deliveries.

Output Steadily Rises

Cincinnati

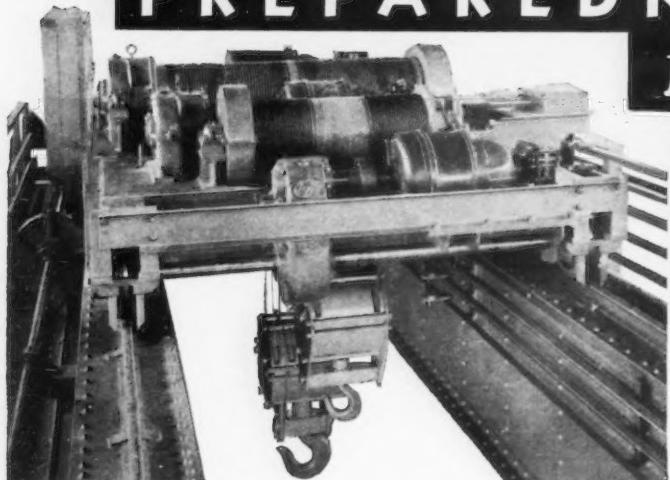
• • • The steady increase in machine tool output in this area continues to surprise and delight the industry. Whereas a year ago, management then thought they were running at very near to the peak of capacity, they are now, with output double that of a year ago and more, wondering whether or not there is even further possibility of expansion. Bonuses and awards of banners to the various departments in individual plants have served as a very strong incentive in stimulating greater employee activity, and, of course, the resulting increase in machine tool output. One company, which has a small standard type machine as one of its products, has been engaged in some missionary work, looking for stimulation of buying against the day when the war boom ends.

National Tool Earns \$45,758

Cleveland

• • • Net sales of the National Tool Co. for the first six months of 1941 were \$1,185,965—an increase of 129.6 per cent over the similar period of last year, it is announced by A. J. Brandt, president. Net profit before federal taxes increased from \$45,758.51 for the first half of 1940 to \$227,067.75 for the same period this year. A dividend of 10c. a share was declared on common stock payable to stockholders of record as of August 30. This is the first dividend the company has paid in 20 years.

IN BUILT
P R E A R E D N E S S
for
Years
to
Come



Simple accessible design is the keynote in the manufacture of Euclid Cranes.

All working parts are liberally proportioned with ample wearing surfaces. Safety factors are figured in accord with the best practice.

This, plus high grade materials and honest workmanship, means long, trouble-free service. A new catalog is now available.

THE EUCLID CRANE & HOIST CO.

1361 Chardon Rd.

Euclid, Ohio

**EUCLID
CRANES
&
HOISTS**

NON-FERROUS METALS

... MARKET ACTIVITIES AND PRICE TRENDS

Far East Tin Price Exceeds Ceiling Here

• • • Sharp advances in tin prices in the Far East have brought the cost of tin delivered in United States to about 52.125c. a lb., or 1½c. above the ceiling price at which importers are permitted to sell the metal domestically. Present high prices in the East are due to heavy Russian buying and the Dutch-American agreement to sell 2000 tons of tin a month to the American government, thus restricting available supplies.

Reports that importers have urged OPM to seek an agreement with the British government to place a maximum price on Far Eastern tin consistent with the 52c. domestic price were denied, with the explanation that the government realizes the difficulties that importers face and will probably take some action on this matter within a short time.

OPA announced that an amendment will be made to the present tin price schedule, classifying as Grade B pig tin that assays 99.80 per cent pure, but contains impurities exceeding the tolerances permitted for Grade A. Meanwhile, the trade is requested by OPA to hold to the Grade B price, 3½c. a lb. less than the 52c. a lb. Grade A ceiling.

Copper and brass mills have given up most of their civilian business and are now occupied almost 100 per cent on production of defense items. It is reported that brass and copper mill fabricators will be asked shortly to discontinue immediately the manufacture of all copper and brass water tubing for civilian use. The manufacture of yellow brass pipe was discontinued several months ago because of zinc shortages. The meeting last week of industry members and OPM officials was for the purpose of considering priority control on all copper and brass scrap.

A new zinc recovery plant at Tooele, Utah, was opened a month ahead of schedule by the International Smelting & Refining Co., an Anaconda subsidiary. This plant,

costing \$340,000, will recover zinc from lead smelter slag, treating 300 to 400 tons of slag a day and recovering about 40 tons of zinc in the form of zinc oxide.

MRC likely will become the sole importer of slab zinc and zinc concentrates, according to current reports. While this will alleviate the supply situation to some extent, smelters that have direct arrangements for bringing in concentrates are very much concerned. They believe that a better arrangement would be to permit business to continue to purchase the concentrates, and have the government guarantee delivery through the aid of the maritime commission and the navy.

The nickel bearing scrap price schedule was amended by OPA last week, making all stainless

steel scrap in briquet form eligible for the \$8 briquetting premium, raising brokers' commissions to \$1 per gross ton, and eliminating the former \$10 differential between two designated grades of scrap by fixing one price of \$90 per ton for so-called 18 per cent chrome scrap containing more than 0.08 per cent carbon, whose price was \$85 per ton, and scrap containing 0.08 per cent or less carbon, whose price was \$95 per ton.

Non-Ferrous Prices

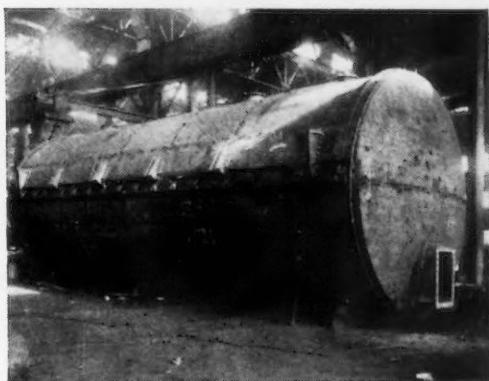
(Cents per lb. for early delivery)

Copper, Electrolytic ¹	12.00
Copper, Lake	12.00
Tin, Straits, New York	52.00
Zinc, East St. Louis ²	7.25
Lead, St. Louis ³	5.70

¹ Mine producers' quotations only, delivered Conn. Valley. Deduct 1¼c. for approximate New York delivery price. ²Add 0.39c. for New York delivery. ³Add 0.15c. for New York delivery.

Going on fifty . . . and going like "sixty"

For 49 years a group of brilliant engineers and skilled craftsmen has made the Sharon plant of P. I. W. a synonym for miracles in steel plate fabrication. No specifications for pressure vessels, tanks, stacks, caissons, were "impossible"; no product went forth below the critical P. I. W. standard. Backed by vast new resources this group, now the Plate and Welding Division of General American Transportation Corporation, has even greater facilities to serve you.



"Fluid Fusion" Welded Vessels
Are Now Made Exclusively By
PLATE & WELDING DIVISION
**GENERAL AMERICAN
TRANSPORTATION CORP.**

Successor to Plate & Welding Div.,
Petroleum Iron Works Co. (P. I. W.)

Plant at Sharon, Pa.
Offices in All Principal Cities

SCRAP

... MARKET ACTIVITIES AND PRICE TRENDS

Shipments of Scrap Fail to Meet Needs

• • • With incoming scrap iron and steel shipments well below consumption at many steel plants and foundries, consumers continue drawing on their inventories and the threat of curtailed production is growing steadily stronger. A trace of optimism has cropped up here and there among dealers, induced by such developments as the unanimity of opinion reached at the Chicago meeting Monday on cast iron scrap prices. However, the general picture fails to reveal any progress toward the one or two conclusive developments necessary to bring out the scrap from the far corners of the nation.

Scrap consumption has increased at foundries where estimated pig iron requirements for September were cut down or elimi-

nated entirely by Washington. Occasionally for brief periods, a few steel companies are forced to increase scrap charges beyond what they consider normal in the present emergency. The biggest worry to steel mill operating officials is the fact that scrap inventories will be pitifully inadequate to support high operations in the coming winter. With the arrival of cold weather, scrap collections from practically all sources will decline sharply.

Scrap and pig iron requirements for the British for fourth quarter are being studied at Washington, with semifinished and finished steel needs. At some points in the British Isles scrap piles are large and transportation is difficult to arrange, apparently. The long-overdue announcement of priorities on scrap is still awaited. Deviations from authorized price ceilings are still occurring. Strange as it may seem, vio-

lations often are due clearly to ignorance of OPA regulations.

A survey of purchasing agents is being made by OPM as the initial step toward the recovery of large amounts of alloy scrap, lost through being mixed inadvertently with other metal scrap at manufacturing plants. Pointing out that all possible sources of supply must be developed, R. C. Allen, deputy chief of the Raw Materials Branch of OPM, asserted that in many plants 20 to 40 per cent loss of alloy steel or iron is common, while in other instances up to 80 per cent may be lost.

Dealers Meet on Cast Iron; National Group Appointed

• • • In an effort to accelerate the flow of cast iron scrap, a committee of dealers met in Chicago, Sept. 14, and drew up recommendations regarding the price schedule, for presentation to Washington. Those attending reported a high degree of unanimity and were optimistic about the probable outcome. Max Schlossberg, M. S. Kaplan & Co., Chicago, is chairman of the committee. Samuel G. Keywell, Samuel G. Keywell Co., Inc., Detroit, is vice-chairman. Other members are Robert Clymer, Luria Bros., Reading, Pa.; Joseph Cohen, General Scrap Iron, Inc., Providence; Max Pressler, Summer & Co., Buffalo; Jack Levand, Simon-Levand Co., Cleveland; Leonard Kreiger, M. W. Singer & Co., Pittsburgh; Wm. J. Wolf, Wolf & Co., Hamilton, Ohio; Clarence Cohen, I. J. Cohen & Co., Kansas City, Kans.; Harry Isaacs, American Iron & Supply Co., Minneapolis.

At Washington appointments were announced for the new Defense Advisory Committee for the scrap and waste materials industries. The committee is split into six subdivisions. Among the membership of 18 individuals are: Scrap metals division—George Birkenstein, Chicago; Joseph Tyroler, Cleveland, and Harry Goldstein, Philadelphia. Scrap iron and steel—Benjamin Schwartz, Jersey City; E. L. Solomon, Pittsburgh, and Franklin A. Alter, Davenport, Iowa.

The advertisement features a central graphic composed of four diamond-shaped panels, each containing a different perforation pattern: a dotted grid, a diagonal ribbed grid, a star-like grid, and a circular grid. Overlaid on these panels is the company's name in a stylized, bold font.
PERFORATED METALS
INDUSTRIAL and ORNAMENTAL

To produce the highest quality of perforated metal as used in the industrial arts and for ornamentation has been the ambition and persistent endeavor of this company. The highest quality best serves the user. We are here to serve you.

ANY METAL • ANY PERFORATION

The Harrington & King Co.
PERFORATING

5657 FILLMORE STREET—CHICAGO, ILL.
New York Office, 114 Liberty Street

SCRAP

New York Scrap Market in Quandary; No OPA Price Set

• • • A tempest buzzed around the ears of the scrap seller for the City of New York early this week. Having no central yard and no way of classifying its scrap, the city customarily sells "miscellaneous iron and steel scrap," which includes a wide variety of items and grades, some of which eventually are put to use instead of being melted. Bidders are unable to find the city's classification listed in the OPA scrap price order.

Bids received Sept. 10 on several lots ranged from \$18.35 to \$24.25 per ton, which brought complaints from persons fearful over possible violations of the maximum price schedules.

Mayor La Guardia was trying to make sense out of the matter early this week. Meanwhile, award of the scrap was being held up.

Pittsburgh—Transactions here are more or less at a standstill, owing to the cleanup previous to September 2 when prices were higher than ceiling levels. Anxiety over the availability of scrap supplies during winter months is reaching an all time high here. Instead of building up supplies to take care of periods when collections are impossible because of weather conditions, major open hearth units are dipping into what little stocks they have in inventories.

Cleveland—The movement of scrap continues sluggish so far as steel mills are concerned. This is attributed to larger purchases by foundries; the slow return of plant scrap from defense plants which in many cases have accumulated larger inventories than they will be able to use for some time to come; decline in the flow of scrap from the railroads; and the last reason advanced is that collections by small dealers have slackened due to Federal price curbs.

The situation is reported even worse at Youngstown. One large mill in Cleveland has been making shipments from its inventory to its Youngstown plant. One mill reported that if the scrap situation didn't improve within a week, its operations definitely would be forced down.

Foundries have been able to buy a good amount of dealer scrap, since under the OPACS schedule dealers may obtain a higher price for foundry scrap than for mill grades.

Chicago—The past week saw slight increase in new orders as most of the scrap ordered for September 2 showed indications of having been shipped. There are still a number of car numbers outstanding against this date, however. Sharp increase in rail scrap orders took place last week. Though this movement can be attributed to the roads picking up rails, there are also reports to the effect that relaying prices have been offered for ordinary scrap rails.

Buffalo—Scrap dealers here have no-

where near the amount of scrap wanted by local steel plants but they said this week they are "gratified" to find the flow of scrap into their yards has become fairly constant and promises to remain so for at least another month. A veteran broker here has estimated the amount of scrap now being shipped back to plants and foundries direct from their consumers at from 10 to 15 per cent of all local shipments.

Cincinnati—Feeling there has been a change of attitude in Washington, dealers are looking with more optimism on the present market situation. A meeting

in Chicago on Monday, for the purpose of making suggestions for a new foundry scrap schedule, raised hopes of dealers generally that the tight foundry scrap situation would receive some relief. The general feeling among dealers is that the establishment of priority on scrap would be more or less welcome.

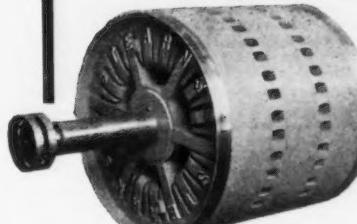
Birmingham—Flow of scrap into this district has declined to a marked degree since the first of September. While operations of the larger steel companies in this area have yet to be adversely affected, comparatively small stocks are rapidly diminishing.

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Catalog on

Stearns
MAGNETIC
PULLEYS

For protection, concentration, reclamation and purification, magnetic pulleys are most widely used due to their flexible size range, ready adaptability to conveying systems, automatic and economical operation and other profitable application features.

The Stearns air-cooled (for more power) Magnetic Pulley is the result of many years' intimate association with problems in all industries — of pioneering advancement in design and construction. There is a reason for the popular acceptance of Stearns pulleys. Get the facts. Write for Bulletin 302.



THE STEARNS POWERFUL AIR-COOLED MAGNETIC PULLEY

Stearns
MAGNETIC MFG. CO.

SEPARATORS DRUMS ROLLS
CLUTCHES BRAKES
SPECIAL MAGNETS

635 S. 28th St. Milwaukee, Wis.

Iron and Steel Scrap (other than railroad scrap)

(Maximum basing point prices as revised by OPACS to Aug. 26, 1941, from which shipping point prices and consumers' delivered prices are to be computed, per gross ton)

Basing Points ➤	Pittsburgh	Johnstown Weirton Steubenville Youngstown Warren Sharon Canton	Chicago	Kokomo	Bethlehem	Claymont Catesville Phoenixville Harrisburg	Sparrows Point	Buffalo	Cleveland	Toledo	Cincinnati* Pittsburgh Middletown Ashland	St. Louis	Duluth Minneapolis**	Birmingham	Chattanooga	Radford, Va.	Worcester Bridgeport Philipsdale, R.I. Los Angeles San Francisco Seattle Portland Minneapolis, Colo.		
▼ GRADES																			
No. 1 heavy melting	\$20.00	\$20.00	\$18.75	\$18.25	\$18.25	\$18.75	\$18.75	\$19.25	\$19.50	.....	\$19.50	\$17.50	\$17.85	\$18.00	\$17.00	.....	14.50	16.50
No. 1 hyd. comp. black sheet	20.00	20.00	18.75	18.25	18.25	18.75	18.75	19.25	19.50	.....	19.50	17.50	17.85	18.00	17.00	.....	14.50	16.50
No. 2 heavy melting	19.00	19.00	17.75	17.25	17.25	17.75	17.75	18.25	18.50	18.50	16.50	16.85	17.00	16.00	(See foot- notes)	13.50	15.50
Dealers' No. 1 bundles	19.00	19.00	17.75	17.25	17.25	17.75	17.75	18.25	18.50	.....	18.50	16.50	16.85	17.00	16.00	.....	12.50	14.50
Dealers' No. 2 bundles	18.00	18.00	16.75	16.25	16.25	16.75	16.75	17.25	17.50	.....	17.50	15.50	15.85	16.00	15.00	.....	9.75	11.75
Mixed borings and turnings	15.25	15.25	14.00	14.25	13.50	14.00	14.00	14.50	14.75	13.10	14.75	12.75	13.10	12.25	12.25	10.00	12.00		
Machine shop turnings	15.50	15.50	14.25	14.50	13.75	14.25	14.25	14.75	15.00	13.35	15.00	13.00	13.35	15.50	15.00	(Alloy, W.Va.)	11.00	13.00	
Shoveling turnings	16.50	16.50	15.25	15.50	14.75	15.25	15.25	15.75	16.00	14.35	16.00	14.00	14.35	16.50	16.00	17.60	14.50	16.50	
No. 1 busheling	19.50	19.50	18.25	17.75	17.75	18.25	18.25	18.75	19.00	.....	19.00	17.00	17.35	17.50	16.00	.....	14.00	18.00
No. 2 busheling	15.50	15.50	14.25	13.75	13.75	14.25	14.25	14.75	15.00	.....	15.00	13.00	13.35	13.50	12.50	.....	10.00	12.00
Cast iron borings	15.75	15.75	14.50	14.00	14.00	14.50	14.50	15.00	15.50	13.60	15.25	13.25	13.60	13.75	12.75	.....	10.25	12.25
Uncut structural, plate scrap	19.00	19.00	17.75	17.25	17.25	17.75	17.75	18.25	18.50	.....	18.50	16.50	16.85	17.00	16.00	.....	13.50	15.50
No. 1 cupola	21.00	21.00	20.00	20.00	22.50	23.00	22.00	20.00	22.00	.....	21.00	20.00	20.35	*19.00	20.00	20.50	21.00	18.00
Heavy breakable cast	19.50	19.50	18.50	18.50	21.00	21.50	21.00	18.50	20.50	.....	19.50	18.50	18.85	*17.50	18.50	20.50	17.00	17.00
Stove plate	19.00	19.00	17.00	16.00	18.00	18.50	18.00	19.00	18.00	15.60	17.50	17.00	14.10	*16.00	17.00	17.50	18.00	14.00	
Low phos. billet, bloom crops	25.00	25.00	23.75	23.75	23.25	23.75	23.75	24.25	24.50	.....	23.50	22.50	22.85	23.00	22.00	.....	19.50	19.50
Low phos. bar crops, smaller	23.00	23.00	21.75	21.75	21.25	21.75	21.75	22.25	22.50	.....	21.50	20.50	20.85	21.00	20.00	.....	19.50	19.50
Low phos. pu'ch'gs., plate scrap ¹	24.75	23.00	21.75	21.75	21.25	21.75	21.75	22.25	22.50	.....	21.50	20.50	20.85	21.00	20.00	.....	17.50	17.50
Machinery cast, cupola size ²	22.00	22.00	21.00	21.00	23.50	24.00	23.50	21.00	23.00	.....	22.00	21.00	21.35	*20.00	21.00	21.50	22.00	23.00
No. 1 mach. cast, drop-broken,	150 lb. and under	22.50	22.50	21.50	21.50	24.00	24.50	24.00	21.50	23.50	.....	22.50	21.50	21.85	20.50	21.50	22.00	22.50
Clean auto cast	22.50	22.50	21.50	21.50	24.00	24.50	24.00	21.50	23.50	.....	22.50	21.50	21.85	20.50	21.50	22.00	22.50	23.50
Punchings and plate scrap ³	23.75	22.00	20.75	20.75	20.25	20.75	20.75	21.25	21.50	.....	20.50	19.50	19.85	20.00	19.00	.....	16.50	16.50
Punchings and plate scrap ⁴	22.75	21.00	19.75	19.75	19.25	19.75	19.75	20.25	20.50	.....	19.50	18.50	18.85	19.00	18.00	.....	15.50	15.50
Heavy axle, forge turnings	21.25	19.50	18.25	18.25	17.75	18.25	18.25	18.75	19.00	.....	18.00	17.00	17.35	17.50	16.50	.....	14.00	14.00
Medium h'y. el. f.ee. turnings	19.75	18.00	16.75	16.75	16.25	16.75	16.75	17.25	17.50	.....	16.50	15.50	15.85	16.00	15.00	.....	12.50	12.50

¹This grade is $\frac{3}{4}$ -in. and heavier, cut 12 in. and under. ²May include clean agricultural cast. ³Under $\frac{3}{4}$ to $\frac{1}{4}$ -in., cut 12 in. and under. ⁴Youngstown, Warren, Sharon and Canton are not basing points on this grade. Middle town and Cincinnati price for this grade is \$15. *Includes Newport, Ky. **Minneapolis and St. Paul are basing points on following grades only: No. 1 cupola, heavy breakable cast, stove plate, machinery cast cupola size, No. 1 machinery cast drop broken, clean auto cast.

Railroad Scrap (Per gross ton, delivered consumers' plants located on line of railroad originating scrap)

Where the railroad originator of the scrap operates in two or more of the basing points named, the highest of the maximum prices established for such basing points shall be the maximum price of the scrap delivered to a consumer's plant at any point on the railroad's line, except that switching charges of 84c. per gross ton shall be subtracted from the maximum prices of scrap originating from railroads operating in Chicago and sold for consumption outside Chicago.

Basing Points ➤	Pittsburgh, Pa. Wheeling Steubenville Youngstown Canton	Chicago	Kokomo	Philadelphia	Wilming ton	Sparrows Point	Cleveland	Buffalo	Pittsburgh Middletown Ashland	St. Louis	Kansas City	Detroit	Duluth	Birmingham	Los Angeles Seattle
▼ GRADES															
No. 1 heavy melting	\$21.00	\$19.75	\$19.25	\$19.75	\$19.75	\$19.75	\$20.50	\$20.25	\$20.50	\$18.50	\$17.00	\$18.85	\$19.00	\$18.00	\$15.50
Scrap rails	22.00	20.75	20.25	20.75	20.75	20.75	21.50	21.25	21.50	19.50	18.00	19.85	20.00	19.00	16.50
Rerolling rails	23.50	22.25	21.75	22.25	22.25	22.25	22.25	22.25	22.25	21.00	19.50	21.35	21.50	20.50	18.00
Scrap rails 3 ft. and under	24.00	22.75	22.25	22.75	22.75	22.75	23.50	23.25	23.50	21.50	20.00	21.85	22.00	21.00	18.50
Scrap rails 2 ft. and under	24.25	23.00	22.50	23.00	23.00	23.00	23.75	23.50	23.75	21.75	20.25	22.10	22.25	21.25	18.75
Scrap rails 18 in. and under	24.50	23.25	22.75	23.25	23.25	23.25	24.00	23.75	24.00	22.00	20.50	22.35	22.50	21.50	19.00

Railroads not operating in a basing point may sell rerolling rails f.o.b. their lines at average price of their sales from Sept. 1, 1940, to Jan. 31, 1941. Rerolling mills may absorb all transportation charges necessary to obtain such rails.

Explanatory Notes

(A basing point includes its switching district.)

the New England shipping point to Johnstown; (2) Shipping point prices for New York City, Brooklyn, New York, and New Jersey shall be computed from the Bethlehem, Pa., basing point.

GULF PORT PRICES: Scrap shipped from Tampa, Pensacola, Gulfport, Mobile, New Orleans, Lake Charles, Port Arthur, Beaumont, Galveston, Texas City, Houston and Corpus Christi, has a maximum shipping point price not exceeding \$14 a gross ton, f.o.b. cars, for No. 1 heavy melting steel. For other grades, the differentials established for Birmingham apply.

REMOTE SCRAP: Material located beyond the zone from which the railroad freight rate to Pittsburgh is \$11.20 is called remote scrap. Consumers desiring to purchase such scrap, but unable to do so without exceeding the ceiling prices, may make application to OPACS for permission to absorb the excess freight charges.

UNPREPARED SCRAP: Regardless of source, maximum price of unprepared scrap is \$2.50 less than maximum for corresponding grade of prepared scrap.

BILLET AND BLOOM CROPS: Where such material originates in the Pittsburgh basing point, it may be sold delivered to a consumer within or without the Pittsburgh point at the price given in Schedule A, plus not more than \$2.50 in transportation charges. Lowest established transportation charges will govern.

Non-Ferrous Scrap

(Dealers buying prices, cents per lb.)

	New York	Philadelphia	Pittsburgh	Cleveland	Detroit	Chicago
No. 1 heavy copper	*10.00	*10.00	*10.00	*10.00	*10.00	*10.00
Light copper	* 8.00	* 8.00	* 8.00	* 8.00	* 8.00	* 8.00
Heavy yellow brass	6.50-6.75	**6.25	7.50-8.00	5.75-6.25	7.00-7.25	7.00-7.50
Light brass	5.75-6.00	**5.50	7.25-7.50	6.00-6.50	6.50-6.75	7.00-7.25
No. 1 comp. turnings	9.50-9.75	**7.75	**9.50-9.75	8.50-9.00	9.00-9.25	9.00-9.25
New yellow brass clips	8.00-8.25	8.50-9.00	7.75-8.00	8.00-8.50	7.50-8.00	7.75-8.25
Soft lead	5.25-5.50	5.00-5.25	4.75-5.00	4.75-5.00	5.00-5.25	4.75-5.00
Old zinc	4.00-4.25	4.25	4.25-4.50	4.00-4.25	4.50-4.75	4.50-5.00
Cast forged aluminum	*11.00	*11.00	*11.00	*11.00	*11.00	*11.00
Old sheet aluminum	*11.00	*11.00	*11.00	*11.00	*11.00	*11.00
Solder joints	8.75-9.00	9.00	7.50-8.00	6.50-6.75	5.50-6.00	7.50-8.00
No. 1 pewter	35.00-37.00	35.00-36.00	31.00-32.00	32.50-34.00	37.50-38.50	32.00-34.00

* OPACS maximum for sale by dealer. ** Nominal.

. . . Comparison of Prices

(Advances Over Past Week in **Heavy Type**; Declines in *Italics*)

(Prices Are F.O.B. Major Basing Points)

Sept. 16, Sept. 9, Aug. 19, Sept. 17,
1941 1941 1941 1940

Sept. 16, Sept. 9, Aug. 19, Sept. 17,
1941 1941 1941 1940

Flat Rolled Steel:

(Cents Per Lb.)

Hot rolled sheets	2.10	2.10	2.10	2.10
Cold rolled sheets	3.05	3.05	3.05	3.05
Galvanized sheets (24 ga.)	3.50	3.50	3.50	3.50
Hot rolled strip.....	2.10	2.10	2.10	2.10
Cold rolled strip	2.80	2.80	2.80	2.80
Plates	2.10	2.10	2.10	2.10
Stain's c.r. strip (No. 302)	28.00	28.00	28.00	28.00

Tin and Terne Plate:

(Dollars Per Base Box)

Tin plate	\$5.00	\$5.00	\$5.00	\$5.00
Manufacturing terne ..	4.30	4.30	4.30	4.30

Bars and Shapes:

(Cents Per Lb.)

Merchant bars	2.15	2.15	2.15	2.15
Cold finished bars	2.65	2.65	2.65	2.65
Alloy bars	2.70	2.70	2.70	2.70
Structural shapes	2.10	2.10	2.10	2.10
Stainless bars (No. 302) ..	24.00	24.00	24.00	24.00

Wire and Wire Products:

(Cents Per Lb.)

Plain wire	2.60	2.60	2.60	2.60
Wire nails	2.55	2.55	2.55	2.55

Rails:

(Dollars Per Gross Ton)

Heavy rails	\$40.00	\$40.00	\$40.00	\$40.00
Light rails	40.00	40.00	40.00	40.00

Semi-Finished Steel:

(Dollars Per Gross Ton)

Rerolling billets	\$34.00	\$34.00	\$34.00	\$34.00
Sheet bars	34.00	34.00	34.00	34.00
Slabs	34.00	34.00	34.00	34.00
Forging billets	40.00	40.00	40.00	40.00
Alloy blooms, billets, slabs	54.00	54.00	54.00	54.00

Wire Rods and Skelp:

(Cents Per Lb.)

Wire rods	2.00	2.00	2.00	2.00
Skelp (grvd)	1.90	1.90	1.90	1.90

The various basing points for finished and semi-finished steel are listed in the detailed price tables, pages 150-154 herein.
On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

Pig Iron:

(Per Gross Ton)

No. 2 fdy., Philadelphia ..	\$25.84	\$25.84	\$25.84	\$24.84
No. 2, Valley furnace ..	24.00	24.00	24.00	23.00
No. 2, Southern Cin'ti ..	24.06	24.06	24.06	23.06
No. 2, Birmingham ..	20.38	20.38	20.38	19.38
No. 2, foundry, Chicago† ..	24.00	24.00	24.00	23.00
Basic, del'd eastern Pa..	25.34	25.34	25.34	24.34
Basic, Valley furnace ..	23.50	23.50	23.50	22.50
Malleable, Chicago† ..	24.00	24.00	24.00	23.00
Malleable, Valley ..	24.00	24.00	24.00	23.00
L. S. charcoal, Chicago ..	31.34	31.34	31.34	30.34
Ferromanganese‡ ..	120.00	120.00	120.00	120.00

†The switching charge for delivery to foundries in the Chicago district is 60c. per ton. ‡For carlots at seaboard.

Scrap:

(Per Gross Ton)

Heavy melt'g steel, P'gh.	\$20.00	\$20.00	\$20.00	\$20.25
Heavy melt'g steel, Phila.	18.75	18.75	18.75	20.625
Heavy melt'g steel, Ch'go.	18.75	18.75	18.75	19.50
No. 1 hy. comp. sheet, Det.	17.85	17.85	17.85	17.50
Low, phos. plate, Youngs'n	23.00	23.00	23.00	23.00
No. 1 cast, Pittsburgh ..	22.00	22.00	22.00	20.25
No. 1 cast, Philadelphia ..	24.00	24.00	24.00	22.25
No. 1 cast, Ch'go,* ..	21.00	21.00	21.00	17.75

*Changed to gross ton basis, April 3, 1941.

Coke, Connellsville:

(Per Net Ton at Oven)

Furnace coke, prompt	\$6.125	\$6.125	\$6.125	\$4.75
Foundry coke, prompt	6.875	6.875	6.875	5.25

Non-Ferrous Metals:

(Cents per Lb. to Large Buyers)

Copper, electro., Conn.* ..	12.00	12.00	12.00	11.50
Copper, Lake, New York ..	12.00	12.00	12.00	11.50
Tin (Straits), New York ..	52.00	52.00	52.00	50.05
Zinc, East St. Louis ..	7.25	7.25	7.25	6.85
Lead, St. Louis ..	5.70	5.70	5.70	4.75
Antimony (Asiatic), N. Y. ..	16.50	16.50	16.50	16.50

*Mine producers only.

. . . Composite Prices

FINISHED STEEL

Sept. 16, 1941	2.30467c. a Lb.
One week ago	2.30467c. a Lb.
One month ago	2.30467c. a Lb.
One year ago	2.30467c. a Lb.

PIG IRON

..... \$23.61 a Gross Ton
..... \$23.61 a Gross Ton
..... \$23.61 a Gross Ton
..... \$22.61 a Gross Ton

SCRAP STEEL

..... \$19.17 a Gross Ton
..... \$19.17 a Gross Ton
..... \$19.17 a Gross Ton
..... \$20.13 a Gross Ton

High

Low

High

Low

High

Low

..... \$23.61, Mar. 20	\$23.45, Jan. 2	\$19.17, Apr. 10
..... 23.45, Dec. 23	22.61, Jan. 2	21.83, Dec. 30
..... 22.61, Sept. 19	20.61, Sept. 12	22.50, Oct. 3
..... 23.25, June 21	19.61, July 6	15.00, Nov. 22
..... 23.25, Mar. 9	20.25, Feb. 16	21.92, Mar. 30
..... 19.74, Nov. 24	18.73, Aug. 11	17.75, Dec. 21
..... 18.84, Nov. 5	17.83, May 14	13.42, Dec. 10
..... 17.90, May 1	16.90, Jan. 27	13.00, Mar. 13
..... 16.90, Dec. 5	13.56, Jan. 3	12.25, Aug. 8
..... 14.81, Jan. 5	13.56, Dec. 6	8.50, Jan. 12
..... 15.90, Jan. 6	14.79, Dec. 15	8.50, Dec. 29
..... 18.21, Jan. 7	15.90, Dec. 16	11.33, Jan. 6
..... 18.71, May 14	18.21, Dec. 17	15.00, Feb. 18

A weighted index based on steel bars, beams, tank plates, wire, rails, black pipe, hot and cold-rolled sheets and strip. These products represent 78 per cent of the United States output. This revised index recapitulated to 1929 in the Aug. 28, 1941, issue.

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

PRICES

Prices of Finished Iron and Steel...

Steel prices shown here are f.o.b. basing points, in cents per lb., unless otherwise indicated. On some products either quantity deductions or quantity extras apply. In many cases gage, width, cutting, physical, chemical extras, etc., apply to the base price. Actual realized prices to the mill, therefore, are affected by extras, deductions, and in most cases freight absorbed to meet competition.

Basing Point ↓ Product													DELIVERED TO		
	Pittsburgh	Chicago	Gary	Cleveland	Birmingham	Buffalo	Youngstown	Sparrows Point	Granite City	Middleton, Ohio	Gulf Ports, Cars	Pacific Ports, Cars	Detroit	New York	Philadelphia
SHEETS															
Hot rolled	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.20¢	2.10¢		2.65¢	2.20¢	2.34¢	2.27¢
Cold rolled ¹	3.05¢	3.05¢	3.05¢	3.05¢		3.05¢	3.05¢		3.15¢	3.05¢		3.70¢	3.15¢	3.39¢	3.37¢
Galvanized (24 ga.)	3.50¢	3.50¢	3.50¢		3.50¢	3.50¢	3.50¢	3.50¢	3.60¢	3.50¢		4.05¢		3.74¢	3.67¢
Enameling (20 ga.)	3.35¢	3.35¢	3.35¢	3.35¢			3.35¢		3.45¢	3.35¢		4.00¢	3.45¢	3.71¢	3.67¢
Long ternes ²	3.80¢		3.80¢									4.55¢			
STRIP															
Hot rolled ³	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢		2.10¢			2.10¢		2.75¢	2.20¢	2.46¢	
Cold rolled ⁴	2.80¢	2.90¢		2.80¢			2.80¢	(Worcester = 3.00¢)				2.90¢	3.16¢		
Cooperage stock	2.20¢	2.20¢			2.20¢		2.20¢							2.56¢	
Commodity C-R	2.95¢			2.95¢			2.95¢	(Worcester = 3.35¢)					3.05¢	3.31¢	
TIN PLATE															
Standard cokes, base box	\$5.00	\$5.00	\$5.00						\$5.10						\$5.32
BLACK PLATE															
29 gage ⁵	3.05¢	3.05¢	3.05¢						3.15¢			4.05¢ (¹⁰)			8.37¢
TERNES, M'FG.															
Special coated, base box	\$4.30	\$4.30	\$4.30						\$4.40						
BARS															
Carbon steel	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢		(Duluth = 2.25¢)	2.50¢	2.80¢	2.25¢	2.49¢	2.47¢		
Rail steel ⁶	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢				2.50¢	2.80¢				
Reinforcing (billet) ⁷	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢			2.50¢	2.55¢	2.25¢	2.39¢		
Reinforcing (rail) ⁷	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢			2.50¢	2.55¢	2.25¢	2.47¢		
Cold finished ⁸	2.65¢	2.65¢	2.65¢	2.65¢		2.65¢		(Detroit = 2.70¢)					3.01¢	2.97¢	
Alloy, hot rolled	2.70¢	2.70¢				2.70¢	(Bethlehem, Massillon, Canton = 2.70¢)				2.80¢				
Alloy, cold drawn	3.35¢	3.35¢	3.35¢	3.35¢		3.35¢						3.45¢			
PLATES															
Carbon steel	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢		2.10¢	2.10¢	2.25¢ ⁽¹¹⁾	2.45¢	2.65¢	2.25¢	2.29¢	2.15¢	
Wrought iron	3.80¢														
Floor plates	3.35¢	3.35¢								3.70¢	4.00¢		3.71¢	3.67¢	
Alloy	3.50¢	3.50¢				(Coatesville = 3.50¢)				3.95¢	4.15¢		3.70¢	3.37¢	
SHAPES															
Structural	2.10¢	2.10¢	2.10¢		2.10¢	2.10¢		(Bethlehem = 2.10¢)	2.45¢	2.75¢		2.27¢	2.215¢		
SPRING STEEL C-R															
0.26 to 0.50 Carbon	2.80¢				2.80¢			(Worcester = 3.00¢)							
0.51 to 0.75 Carbon	4.30¢				4.30¢			(Worcester = 4.50¢)							
0.76 to 1.00 Carbon	6.15¢				6.15¢			(Worcester = 6.35¢)							
1.01 to 1.25 Carbon	8.35¢				8.35¢			(Worcester = 8.55¢)							
WIRE⁹															
Bright	2.60¢	2.60¢			2.60¢	2.60¢		(Worcester = 2.70¢)			3.10¢			2.92¢	
Galvanized	2.60¢	2.60¢			2.60¢	2.60¢		(Worcester = 2.70¢)			3.10¢			2.92¢	
Spring	3.20¢	3.20¢			3.20¢			(Worcester = 3.30¢)			3.80¢			3.52¢	
PILING															
Steel sheet	2.40¢	2.40¢				2.40¢					2.95¢			2.72¢	
IRON BARS															
Common		2.25¢					(Terre Haute, Ind. = 2.15¢)								
Wrought single refined	4.40¢														
Wrought double refined	5.40¢														

¹ Mill run sheets are 10c. per 100 lb. less than base; and primes only, 25c. above base. ² Unassorted 8-lb. coating. ³ Widths up to 12 in. ⁴ Carbon 0.25 per cent and less. ⁵ Applies to certain width and length limitations. ⁶ For merchant trade. ⁷ Straight lengths as quoted by distributors. ⁸ Also shafting. For quantities of 20,000 to 39,999 lb. ⁹ Carload lot to manufacturing trade. ¹⁰ Boxed. ¹¹ Ship plates only.

PRICES

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point (rerolling only). Prices delivered Detroit are \$2 higher; f.o.b. Duluth, billets only, \$2 higher.

Per Gross Ton

Rerolling \$34.00
Forging quality 40.00

Shell Steel

Basic open hearth shell steel, f.o.b. Pittsburgh and Chicago.

Per Gross Ton

3 in. to 12 in. \$52.00
12 in. to 18 in. 54.00
18 in. and over 56.00

Note: The above base prices apply on lots of 1000 tons of a size and section to which are to be added extras for chemical requirements, cutting to length, or quantity.

Sheet Bars

Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

Per Gross Ton

Open hearth or bessemer \$34.00

Skelp

Pittsburgh, Chicago, Youngstown, Coatesville, Pa., Sparrows Point, Md.

Per Lb.

Grooved, universal and sheared 1.90c.

Wire Rods

(No. 5 to 9/32 in.) *Per Lb.*

Pittsburgh, Chicago, Cleveland 2.00c.
Worcester, Mass. 2.10c.
Birmingham 2.00c.
San Francisco 2.50c.
Galveston 2.25c.

9/32 in. to 47/64 in., 0.15c. a lb. higher. Quantity extras apply.

Alloy Steel Blooms, Billets and Slabs

Per Gross Ton

Pittsburgh, Chicago, Canton, Massillon, Buffalo or Bethlehem \$54.00

TOOL STEEL

(F.o.b. Pittsburgh)

Base per Lb.

High speed	67c.
High-carbon-chromium	43c.
Oil hardening	24c.
Special carbon	22c.
Extra carbon	18c.
Regular carbon	14c.

Prices for warehouse distribution to all points on or East of Mississippi River are 2c. a lb. higher. West of Mississippi quotations are 3c. a lb. higher.

PIG IRON

All prices set in bold face type are maxima established by OPACS on June 24, 1941. Other domestic prices are delivered quotations per gross ton computed on the basis of the official maxima.

	No. 2 Foundry	Basic	Bessemer	Malleable	Low Phosphorous	Charcoal
Boston	\$25.50	\$25.00	\$26.50	\$26.00	.....	.....
Brooklyn	27.50	.....	.....	28.00	.....	.....
Jersey City	26.53	26.03	27.53	27.03	.....	.....
Philadelphia	25.84	25.34	26.84	26.34	.....	.....
Bethlehem, Pa.	\$25.00	\$24.50	\$26.00	\$25.50	.....	.....
Everett, Mass.	25.00	24.50	26.00	25.50	.....	.....
Swedeland, Pa.	25.00	24.50	26.00	25.50	.....	.....
Steelton, Pa.	24.50	.....	.....	.....	\$29.50	.....
Birdsboro, Pa.	25.00	24.50	26.00	25.50	29.50	.....
Sparrows Point, Md.	25.00	24.50	25.00	24.50	.....	.....
Erie, Pa.	24.00	23.50	25.00	24.50	.....	.....
Neville Island, Pa.	24.00	23.50	24.50	24.00	.....	.....
Sharpsville, Pa.*	24.00	23.50	24.50	24.00	.....	.....
Buffalo	24.00	23.00	25.00	24.50	29.50	.....
Cincinnati	24.44	24.61	.....	25.11	.....	.....
Canton, Ohio	25.39	24.89	25.89	25.39	.....	.....
Mansfield, Ohio	25.94	25.44	26.44	25.94	.....	.....
St. Louis	24.50	24.02	.....	.....	.....	.....
Chicago	24.00	23.50	24.50	24.00	.....	\$31.34
Granite City, Ill.	24.00	23.50	24.50	24.00	.....	.....
Cleveland	24.00	23.50	24.50	24.00	.....	.....
Hamilton, Ohio	24.00	23.50	.....	24.00	.....	.....
Toledo	24.00	23.50	24.50	24.00	.....	.....
Youngstown*	24.00	23.50	24.50	24.00	.....	.....
Detroit	24.00	23.50	24.50	24.00	.....	.....
Lake Superior fc.	.....	.....	.....	.....	.....	\$28.00
Lyles, Tenn. fc.†	.....	.....	.....	.....	.....	33.00
St. Paul	26.63	.....	27.13	26.63	.....	.....
Duluth	24.50	.....	25.00	24.50	.....	.....
Birmingham	20.38	19.00	25.00	.....	.....	.....
Los Angeles	27.50	.....	.....	.....	.....	.....
San Francisco	27.50	.....	.....	.....	.....	.....
Seattle	27.50	.....	.....	.....	.....	.....
Provo, Utah	22.00	.....	.....	.....	.....	.....
Montreal	27.50	27.50	.....	28.00	.....	.....
Toronto	25.50	25.50	.....	26.00	.....	.....

GRAY FORGE IRON

Valley or Pittsburgh furnace \$23.50

*Pittsburgh Coke & Iron Co. (Sharpsville, Pa., furnace only) and the Struthers Iron and Steel Co., Struthers, Ohio, may charge 50c. a ton in excess of basing point prices for No. 2 foundry, basic, bessemer and malleable.

Switching Charges: Basing point prices are subject to an additional charge for delivery within the switching limits of the respective districts.

Silicon Differentials: Basing point prices are subject to an additional charge not to exceed 50c. a ton for each 0.25 per cent silicon content in excess of base grade (1.75 per cent to 2.25 per cent).

Phosphorous Differential: Basing point prices are subject to a reduction of 38c. per ton for phosphorous content of 0.70 per cent and over.

† Price shown is for low-phosphorous iron; high-phosphorous sells for \$28.50 at the furnace.

Manganese Differentials: Basing point prices are subject to an additional charge not to exceed 50c. a ton for each 0.50 per cent manganese content in excess of 1.00 per cent.

WAREHOUSE PRICES

Pitts- burgh	Chi- cago	Cleve- land	Phi- ladel- phia	New York	Detroit	Buffalo	Boston	Birm- ingham	St. Louis	St. Paul	Mil- waukee	Los Angeles	
Sheets, hot rolled	\$3.35	\$3.25	\$3.35	\$3.75	\$3.58	\$3.43	\$3.25	\$3.71	\$3.45	\$3.39	\$3.30	\$3.38	\$5.10
Sheets, cold rolled	.....	4.10	4.05	4.05	4.60	4.30	4.30	3.68	.....	4.24	4.35	4.23	7.30
Sheets, galvanized	4.65	4.85	4.75	5.00	5.00	4.84	4.75	5.11	4.75	4.99	4.75	4.98	6.30
Strip, hot rolled	3.60	3.60	3.50	3.95	3.96	3.68*	3.82	4.06	3.70	3.74	3.65	3.73	....
Strip, cold rolled	3.20	3.50	3.20	3.31	3.51	3.40	3.52	3.46	.....	3.61	3.83	3.54	....
Plates	3.40	3.55	3.40	3.75	3.76	3.60	3.62	3.85	3.55	3.69	3.80	3.68	4.95
Structural shapes	3.40	3.55	3.58	3.75	3.75	3.65	3.40	3.85	3.55	3.69	3.80	3.68	4.95
Bars, hot rolled	3.35	3.50	3.25	3.85	3.84	3.43	3.35	3.98	3.50	3.64	3.75	3.63	**4.15
Bars, cold finished	3.65	3.75	3.75	4.06	4.09	3.80	3.75	4.13	4.43	4.02	4.34	3.88	6.60
Bars, ht. rld. SAE 2300	7.45	7.35	7.55	7.31	7.60	7.67	7.35	7.50	.....	7.72	7.45	7.58	10.35
Bars, ht. rld. SAE 3100	5.75	5.65	5.85	5.86	5.90	5.97	5.65	6.05	.....	6.02	6.00	5.88	9.35
Bars, ed. drn. SAE 2300	8.40	8.40	8.40	8.56	8.84	8.70	8.40	8.63	.....	8.77	8.84	8.63	11.35
Bars, ed. drn. SAE 3100	6.75	6.75	7.75	7.16	7.19	7.05	6.75	7.23	.....	7.12	7.44	6.98	10.35

BASE QUANTITIES: Hot rolled sheets, cold rolled sheets, hot rolled strip, plates, shapes and hot rolled bars, 400 to 1999 lb., galvanized sheets, 150 to 1499 lb.; cold rolled strip, extras apply on all quantities; cold finished bars, 1500 lb. and over; SAE bars, 1000 lb. and over. Exceptions: Chicago, galvanized sheets, 500 to 1499 lb.; Philadelphia, galvanized sheets, one to nine bundles, cold rolled sheets, 1000 to 1999 lb.; Detroit, galvanized sheets, 500 to 1499 lb.; Buffalo, cold rolled sheets, 500 to 1500 lb., galvanized sheets, 450 to 1499 lb., cold rolled strips, 0.0971 in. thick; Boston, cold rolled and galvanized sheets, 450 to 3749 lb.; Birmingham, hot rolled sheets, strip and bars, plates and shapes, 400 to 3999 lb., galvanized sheets, 500 to 1499 lb.; St. Louis, cold rolled sheets, 400 to 1499 lb., galvanized sheets, 500 to 1499 lb., cold rolled strip 0.095 in. and lighter; Milwaukee, cold rolled sheets, 400 to 1499 lb., galvanized sheets, 500 to 1499 lb.; New York, hot rolled sheets, 0 to 1999 lb., cold rolled sheets, 400 to 1499 lb.; Los Angeles, cold rolled sheets, 300 to 1999 lb., galvanized sheets, 24 ga.—1 to 1499 lb. Extras for size, quality, etc., apply on above quotations.

*12 gage and heavier, \$3.43. **Over 4 in. wide and over 1 in. thick, \$4.95.

PRICES

CORROSION AND HEAT-RESISTING STEELS

(Per lb. base price, f.o.b. Pittsburgh)

Chromium-Nickel Alloys

	No. 304	No. 302
Forging billets	21.25c.	20.40c.
Bars	25.00c.	24.00c.
Plates	29.00c.	27.00c.
Structural shapes	25.00c.	24.00c.
Sheets	36.00c.	34.00c.
Hot rolled strip	23.50c.	21.50c.
Cold rolled strip	30.00c.	28.00c.
Drawn wire	25.00c.	24.00c.

Straight-Chromium Alloys

	No. 410	No. 430	No. 442	No. 446
F.Billets	15.73c.	16.15c.	19.13c.	23.38c.
Bars	18.50c.	19.00c.	22.50c.	27.50c.
Plates	21.50c.	22.00c.	25.50c.	30.50c.
Sheets	26.50c.	29.00c.	32.50c.	36.50c.
Hotstrip	17.00c.	17.50c.	24.00c.	25.00c.
Cold st.	22.00c.	22.50c.	32.00c.	52.00c.

Chromium-Nickel Clad Steel (20%)

	No. 304
Plates	18.00c.*
Sheets	19.00c.

*Includes annealing and pickling.

ELECTRICAL SHEETS

(Base, f.o.b. Pittsburgh)

	Per Lb.
Field grade	3.20c.
Armature	3.55c.
Electrical	4.05c.
*Motor	4.95c.
*Dynamo	5.65c.
Transformer 72	6.15c.
Transformer 65	7.15c.
Transformer 58	7.65c.
Transformer 52	8.45c.

Silicon strip in coils—Sheet price plus silicon sheet extra width extra plus 25c. per 100 lb. for coils. Pacific ports add 75c. per 100 lb.

*In some instances motor grade is referred to as dynamo grade and dynamo grade is referred to as dynamo special.

ROOFING TERNE PLATE

(F.o.b. Pittsburgh, per package of 112 Sheets)

	20x14 in.	20x28 in.
8-lb. coating I.C...	\$6.00	\$12.00
15-lb. coating I.C...	7.00	14.00
20-lb. coating I.C...	7.50	15.00
25-lb. coating I.C...	8.00	16.00
30-lb. coating I.C...	8.63	17.25
40-lb. coating I.C...	9.75	19.50

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Per Cent Off List

Machine and Carriage Bolts:
6 1/2 in., shorter and smaller... 65 1/2
6 x 5/8 in., and shorter..... 63 1/2
6 in. by 3/4 to 1 in. and shorter.. 61
1 1/2 in. and larger, all length... 59
All diameters over 6 in. long... 59
Lag, all sizes..... 62
Plow bolts..... 65

Nuts, Cold Punched or Hot Pressed: (hexagon or square)

	62
9/16 to 1 in. inclusive..... 59	
1 1/8 to 1 1/2 in. inclusive..... 57	
1 1/8 in. and larger..... 56	

On above bolts and nuts, excepting plow bolts, additional allowance of 10 per cent for full container quantities. There is an additional 5 per cent allowance for carload shipments.

Semi-Fin. Hexagon Nuts	U.S.S.	S.A.E.
7/16 in. and smaller...	64	
1/2 in. and smaller.....	62	
1/2 in. through 1 in....	60	
9/16 to 1 in.....	59	..
1 1/8 in. through 1 1/2 in.	57	58
1 1/8 in. and larger.....	56	..

In full container lots, 10 per cent additional discount.

Stove bolts, packages, nuts loose	71 and 10
Stove bolts in packages, with nuts attached.....	71
Stove bolts in bulk	80

On stove bolts freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago, New York lots of 200 lb. or over.

Large Rivets (1/2 in. and larger)	Base per 100 Lb.
F.o.b Pittsburgh, Cleveland, Chicago, Birmingham.....	\$3.75

Small Rivets (7/16 in. and smaller)	Per Cent Off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	65 and 5

Cap and Set Screws	Per Cent Off List
Upset hex. head cap screws U.S.S. or S.A.E. thread, 1 in. and smaller	60

Upset set screws, cup and oval points	68
Milled studs	40

Flat head cap screws, listed sizes	30
Filister head cap, listed sizes	46

Freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago or New York on lots of 200 lb. or over.

WIRE PRODUCTS

(To the trade, f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham)

Base per Keg

Standard wire nails.....	\$2.55
Coated nails	2.55

Cut nails, carloads	3.85
Base per 100 Lb.	

Annealed fence wire.....	\$3.05
Base Column	

Woven wire fence*.....	67
Fence posts (carloads)	69

Single loop bale ties	59
Galvanized barbed wire†.....	70

Twisted barbless wire	70
*15 1/2 gage and heavier. †On 80-rod spools in carload quantities.	

Note: Birmingham base same on above items, except spring wire.

BOILER TUBES

Seamless Steel and Lap Weld Commercial Boiler Tubes and Locomotive Tubes.

Minimum Wall

(Net base prices per 100 ft., f.o.b. Pittsburgh, in carload lots)

Lap

Seamless Weld,

Cold Hot Hot

Drawn Rolled Rolled

\$ \$ \$

2 in. o.d. 13 B.W.G. 15.03 13.04 12.38

2 1/2 in. o.d. 12 B.W.G. 20.21 17.54 16.58

3 in. o.d. 12 B.W.G. 22.48 19.50 18.35

3 1/2 in. o.d. 11 B.W.G. 28.37 24.62 23.15

4 in. o.d. 10 B.W.G. 35.20 30.54 28.66

(Extras for less carload quantities)

40,000 lb. or ft. over Base

30,000 lb. or ft. to 39,999 lb. or ft. 5%

20,000 lb. or ft. to 29,999 lb. or ft. 10%

10,000 lb. or ft. to 19,999 lb. or ft. 20%

5,000 lb. or ft. to 9,999 lb. or ft. 30%

2,000 lb. or ft. to 4,999 lb. or ft. 45%

Under 2,000 lb. or ft. 65%

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills (F.o.b. Pittsburgh only on wrought pipe)

Base Price = \$200 Per Net Ton

Steel (Butt Weld)

Black Galv.

1/2 in.	63 1/2	51
3/4 in.	66 1/2	55
1 to 3 in.	68 1/2	57 1/2

Wrought Iron (Butt Weld)

Black Galv.

1/2 in.	24	3 1/2
3/4 in.	30	10
1 and 1 1/4 in.	34	16
1 1/2 in.	38	18 1/2

Steel (Lap Weld)

Black Galv.

2 in.	61	49 1/2
2 1/2 and 3 in.	64	52 1/2
3 1/2 to 6 in.	66	54 1/2

Wrought Iron (Lap Weld)

The case of the unhappy saw maker:

...who became a
pioneer in making
high grade steels



WHEN Henry Disston started making saws in 1840, he had to import his steel from Europe. His saw business grew rapidly . . . but he wasn't satisfied. He wanted better steel to make better saws.

"I'll make my own steel," he decided. So in 1855, Henry Disston built his own furnace . . . then melted, cast and rolled the first crucible saw steel ever made in America!

Following Henry's example, the Disston organization has kept on pioneering in the manufacture of high grade steels . . .

In 1906, the first commercial heat of electric tool steel of crucible quality to be made in America was cast in the Disston Steel Works.

Today, Disston metallurgists, engineers and steel craftsmen continue to blaze new trails. For instance, they have perfected Disston 6-N-6

High Speed Steel . . . a remarkable high speed steel that combines toughness and splendid wear resistance with excellent response to heat treatment.

Help for troubled tool makers: Disston engineers and metallurgists will be glad to help you in selecting the best tool steels for each job . . . to get more "mileage" per tool. Also, there's valuable information in the illustrated 73-page catalog, "Disston Tool Steels." If you haven't received your copy of this useful book, write for one today to Henry Disston & Sons, Inc., 919 Tacony, Philadelphia, Pa.

6-N-6 High Speed Steel passes a tough test

Disston Tool Steels have to win their "service stripes" right in the Disston plants. For two years, 6-N-6 High Speed Steel was used for chisels to cut 1.60% carbon file steels at speeds up to 420 cuts per minute. The extreme toughness, fatigue and wear resistance of 6-N-6 in this long production test . . . and in general machine shop applications . . . proved that 6-N-6 is a match for the best 18-4-1 steels in most high speed work.

HENRY DISSTON & SONS, INC.
919 Tacony, Philadelphia, Pa.

I don't have a copy of your catalog, "Disston Tool Steels." Please send me one, without obligation, today.

Name _____

Company _____

Address _____



DISSTON TOOL STEELS

PRICES

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans, Domestic, 80%, per gross ton (carloads) ... \$120.00

Spiegeleisen

Per Gross Ton Furnace **Other Ferroalloys**

Domestic, 19 to 21% \$36.00 Ferrotungsten, per lb. contained W, del'd carload \$2.00
Domestic, 26 to 28% 49.50 Ferrotungsten, 100 lb. and less \$2.25

Electric Ferrosilicon

(Per Gross Ton, Delivered Lump Size)

50% (carload lots, bulk)	\$74.50*	Ferrocolumbium, per lb. contained Cb, f.o.b. Niagara Falls, N. Y., ton lots \$2.25†
50% (ton lots, packed)	87.00*	Ferrovanadium, contract, per lb. contained V, del'd \$2.70 to \$2.90†
75% (carload, lots, bulk)	135.00*	Ferrocobaltitium, 15-18 Ti, 7-8 C, f.o.b. furnace, carload, contract, net ton \$142.50
75% (ton lots, packed)	151.00*	Ferrocarbontitanium, 17-20 Ti, 3-5 C, f.o.b. furnace, carload, contract, net ton \$157.50

Silvery Iron

(Per Gross Tons, base 6.00 to 6.50 \$1)
F.O.B. Jackson, Ohio \$29.50*
Buffalo \$30.75*

For each additional 0.50% silicon add \$1 a ton. For each 0.50% manganese over 1% add 50c. a ton. Add \$1 a ton for 0.75% phosphorous or over.

* Official OPACS price established June 24.

Bessemer Ferrosilicon*

Prices are \$1 a ton above Silvery Iron quotations of comparable analysis.

*Prices published in issues previous to Sept. 4, 1941, have been revised to above basis.

Ferrochrome

(Per Lb. Contained Cr, Delivered Carlots, Lump Size, on Contract)

4 to 6 carbon	11.00c.	Molybdenum oxide briquettes 48-52 Mo, per lb. contained Mo, f.o.b. Langloch, Pa....	80c.
2 carbon	17.50c.	Molybdenum oxide, in cans, per lb. contained Mo, f.o.b. Washington, Pa.	80c.
1 carbon	18.50c.		
0.10 carbon	20.50c.		
0.06 carbon	21.00c.		

Spot prices are 1/4c. per lb. of contained chromium higher.

Silico-Manganese

(Per Gross Ton, Delivered, Lump Size, Bulk, on Contract)

3 carbon	\$113.00*
2.50 carbon	118.00*
2 carbon	123.00*
1 carbon	133.00*

RAILS, TRACK SUPPLIES

(F.o.b. Mill)

Standard rails, heavier than 60 lb., gross ton \$40.00
Angle bars, 100 lb. 2.70

(F.o.b. Basing Points) Per Gross Ton
Light rails (from billets) \$40.00
Light rails (from rail steel) 39.00

Base per Lb.

Cut spikes	3.00c.
Screw spikes	5.15c.
Tie plates, steel	2.15c.
Tie plates, Pacific Coast	2.30c.
Track bolts, heat treated, to railroads	5.00c.
Track bolts, jobbers discount..	63-5

Basing points, light rails—Pittsburgh, Chicago, Birmingham; spikes and tie plates—Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa., Buffalo; spikes alone—Youngstown, Lebanon, Pa., Richmond, Va.

FLUORSPAR

Per Net Ton

Domestic washed gravel, 85-5 f.o.b. Kentucky and Illinois mines, all rail.....	\$22.00 to \$23.00
Domestic, f.o.b. Ohio River landing barges	22.00 to 23.00
No. 2 lump, 85-5 f.o.b. Kentucky and Illinois mines..	22.00 to 23.00
Foreign, 85% calcium fluoride, not over 5% Si, c.i.f. Atlantic ports, duty paid.....	Nominal
Domestic No. 1 ground bulk, 96 to 98%, calcium fluoride, not over 2 1/2% silicon, f.o.b. Illinois and Kentucky mines....	31.00
As above, in bags, f.o.b. same mines	32.60

REFRACTORIES

(F.o.b. Works)

Fire Clay Brick	Per 1000
Super-duty brick, St. Louis...	\$64.60
First quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois	51.30
First quality, New Jersey....	56.00
Second quality, Pennsylvania, Maryland, Kentucky, Missouri, and Illinois	46.55
Second quality, New Jersey....	51.00
No. 1, Ohio	43.00
Ground fire clay, net ton.....	7.60

Silica Brick

Pennsylvania	\$51.30
Chicago District	58.90
Birmingham	51.30
Silica cement, net ton (Eastern)	9.00

Chrome Brick

Per Net Ton

Standard, f.o.b. Baltimore, Plymouth Meeting and Chester....	\$54.00
Chemically bonded, f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	54.00

Magnesite Brick

Standard f.o.b. Baltimore and Chester	\$76.00
Chemically bonded, f.o.b. Baltimore	65.00

Grain Magnesite

Domestic, f.o.b. Baltimore and Chester in sacks	\$44.00
Domestic, f.o.b. Chewelah, Wash. (in bulk)	22.00

ORES

Lake Superior Ores (51.50% Fe.)

(Delivered Lower Lake Ports)

Per Gross Ton

Old range, bessemer, 51.50....	\$4.75
Old range, non-bessemer, 51.50	4.60
Mesaba, bessemer, 51.50.....	4.60
Mesaba, non-bessemer, 51.50....	4.45
High phosphorus, 51.50.....	4.35

Foreign Ores*

(C.i.f. Philadelphia or Baltimore, Exclusive of Duty)

Per Unit

African, Indian, 44-48 Mn. ....	.65c. to .66c.
African, Indian, 49-51 Mn. ....	.67c. to .69c.

Brazilian, 46-48 Mn..... 65c.

Cuban, del'd, 51 Mn..... 79c. to 81c.

Per Short Ton Unit

Tungsten, Chinese Wolframite, duty paid, delivered.... \$24 to \$26

Tungsten, domestic scheelite, at mine

Chrome ore, lump, c.i.f. Atlantic Seaboard, per gross ton; South African (low grade)..... Nom.

Rhodesian, 45

Rhodesian, 48

\$32.00 \$39.00-\$40.00

*Importations no longer readily available. Prices shown are nominal.

COKE

Furnace

Per Net Ton

Connellsville, prompt ... \$6.00 to \$6.25

Foundry

Connellsville, prompt ... \$6.75 to \$7.00

By-product, Chicago

By-product, New England.... \$13.75

By-product, Newark

\$12.40 to \$12.95

By-product, Philadelphia

\$12.13

By-product, Cleveland

\$12.30

By-product, Cincinnati

\$11.75

By-product, Birmingham

\$8.50

By-product, St. Louis

\$10.75 to \$11.00

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154—THE IRON AGE, September 18, 1941

LOGEMANN

Presses for Sheet Scrap

THE NATION NEEDS YOUR SHEET SCRAP!

In mills, industrial plants and scrap yards, LOGEMANN SCRAP PRESSES are working day and night to prepare sheet scrap for the furnaces.

Sheet mills particularly recognize the value of the years of experience and the performance records which back up LOGEMANN designs and workmanship.

The line includes scrap presses *designed for mill service*, presses *designed for automobile plant conditions*, presses *designed for general plant applications*.

Write for details

LOGEMANN BROTHERS CO.
3164 W. Burleigh St.

Milwaukee, Wis.



SALES POSSIBILITIES

... CONSTRUCTION, PLANT EXPANSION AND EQUIPMENT BUYING

North Atlantic States

• **American Brass Co.**, Waterbury, Conn., has approved plans for one-story addition, 72 x 108 ft. Cost close to \$60,000 with equipment.

Nicholson File Co., Acorn Street, Providence, R. I., has asked bids on general contract for one-story power house. Cost about \$65,000 with equipment. Jencks & Ballou, Industrial Trust Building, are architects and engineers.

Bullard Co., Bridgeport, Conn., has arranged with Defense Plant Corp., Washington, for appropriation of \$300,000, in addition to sum previously noted, for purchase of equipment for production for government. Superstructure will begin soon for one-story addition, 60 x 156 ft., for which contract recently was let to Turner Construction Co., 420 Lexington Avenue, New York, to be used for storage and distribution.

American Optical Co., Mechanic Street, Southbridge, Mass., plans new one-story plant at Brattleboro, Vt., for lens' grinding for government. Cost about \$300,000. Fund in that amount will be provided by Defense Plant Corp., Washington, for project.

Electric Specialty Co., South Street, Stamford, Conn., motors, generators, parts, etc., plans one-story addition. Cost close to \$50,000 with equipment.

New England Metallurgical Corp., 284 Grove Street, Worcester, Mass., metal specialties, is erecting one-story addition, for which general contract recently was let to J. B. Lowell, Inc., 173 Grove Street. Cost close to \$40,000 with equipment. Waghorne-Brown Co., 44 School Street, Boston, is architect.

Hanson-Whitney Machine Co., Bartholomew Avenue, Hartford, Conn., metal-shaping machinery and parts, will equip two-story addition, for which contract recently was let to Partlett & Brainard Co., 103 Woodbine Street, for production of gages and kindred precision equipment for government. Fund of \$300,000 will be secured through Defense Plant Corp., Washington.

Work Projects Administration, Brewster Building, Long Island City, Federal agency, has leased over 20,000 sq. ft. of floor space in building on south side of Bridge Plaza, Twenty-third to Twenty-fourth Street, for new machine and repair shop for motor trucks, etc.

Watervliet Tool Co., Inc., 1039 Broadway, Albany, N. Y., reamers and kindred cutting tools, has taken out permit for one-story addition. Cost close to \$50,000 with equipment.

J. M. Myers, 1 Columbia Place, is consulting engineer.

M. W. Kellogg Co., 225 Broadway, New York, engineer and contractor, oil refinery and power plant equipment, has secured contract from War Department for new synthetic ammonia plant at Sterlington, La., to be operated by Commercial Solvents Corp., 17 East Forty-second Street, New York, recently noted in these columns. It will include storage and distributing buildings, machine shop, power house and other structures. Fund of \$9,250,000 will be furnished by Defense Plant Corp., Washington.

United States Metal Products Co., 128 Mott Street, New York, has leased floor in building at 650 First Avenue, about 12,000 sq. ft. of floor space, for expansion.

Chicago Pneumatic Tool Co., 6 East Forty-fourth Street, New York, has purchased one-story plant on Outwater Lane, Garfield, N. J., totaling about 90,000 sq. ft. of floor space, for branch plant for manufacture of hydraulic equipment for military and naval aircraft. Property has been owned by Champlain Corp., rotogravure and other printing equipment and parts, subsidiary of Interchemical Corp., 75 Varick Street, New York, and will remove plant to building in latter city owned by parent corporation, where production will be concentrated.

Air-Cooled Motors Corp., Liverpool Road,

Syracuse, N. Y., has let general contract to Conlon-Farnsworth, Inc., State Tower Building, for one-story addition, 65 x 160 ft. Cost close to \$70,000 with equipment. Lawrence M. Cook, 250 Whittier Avenue, is engineer.

Odenbach Shipbuilding Corp., Rochester, N. Y., John H. Odenbach, 323 Aberdeen Street, head, recently organized, has arranged with Defense Plant Corp., Washington, for appropriation of \$870,000 for initial work on new shipbuilding plant at Manitou Beach, Lake Ontario, about 10 miles from city, for production of "coaster" type vessels for Maritime Commission, Washington.

Niagara Alkali Co., 4205 Buffalo Avenue, Niagara Falls, N. Y., has let general contract to Gaylord S. Guenther & Co., Inc., 1887 Cleveland Avenue, for two-story addition, 70 x 140 ft., with extension 20 x 70 ft. Cost close to \$75,000 with equipment.

Eastman Kodak Co., Kodak Park, Rochester, N. Y., is erecting five-story addition, 50 x 60 ft., for which general contract recently was let to Ridge Construction Co., Kodak Park. Cost over \$100,000 with equipment.

Commanding Officer, Ordnance Department, Picatinny Arsenal, near Dover, N. J., asks bids until Sept. 22 for drills (Circular 457), sinker nails (Circular 467), safety wire (Circular 460), and tool bits (Circular 470).

Worthington Pump & Machinery Corp., Harrison, N. J., has leased one-story building at 265 Passaic Street, Newark, totaling 18,000 sq. ft. of floor space, for expansion in storage and distribution department.

Grand City Container Corp., 622 West Fifty-seventh Street, New York, corrugated boxes and containers, will begin superstructure for one and two-story plant, 300 x 800 ft., on 15-acre tract at North Bergen, N. J. Brown & Matthews, Inc., 122 East Forty-second Street, New York, is general contractor. Cost over \$700,000 with equipment. Ely Jacques Kahn and Robert Allan Jacobs, 2 Park Avenue, New York, are architects.

Pressed Steel Co., Wilkes-Barre, Pa., steel stampings, rings, etc., plans one-story addition. Cost close to \$50,000 with equipment.

Philadelphia Electric Co., 1000 Chestnut Street, will begin excavations for new Southwark steam-electric generating station, on site on Delaware River, for ultimate capacity of 600,000-kw. Initial unit of 150,000-kw. is scheduled for completion in 24 months, with another turbine-generator and auxiliary equipment of like capacity to be installed immediately thereafter. Entire project will cost about \$45,000,000.

Kennedy-Van Saun Mfg. & Engineering Corp., Danville, Pa., mining, crushing, pulverizing and other machinery, has let general contract to Austin Co., Cleveland, for one-story addition, 100 x 200 ft. Cost over \$80,000 with equipment.

General Electric Co., Schenectady, N. Y., will carry out further expansion at branch plant at Erie, Pa., for production of turbine gears and other naval equipment for government. Fund of \$6,763,580 has been secured through Defense Plant Corp., Washington, for buildings and equipment.

United States Engineer Office, Baltimore, asks bids until Oct. 3 for pumping plant and appurtenant works on site in Hanover Township, Luzerne County, Pa. (Circular 31).

Alban Tractor Co., Inc., 725 East Twenty-fifth Street, Baltimore, road machinery and contractors' equipment, has asked bids on general contract for new one and two-story shop, storage and distributing plant, about 100 x 100 ft., with repair and maintenance departments. Cost about \$90,000 with equipment.

Purchasing Agent, Federal Security Agency, St. Elizabeth's Hospital, Washington, asks bids until Sept. 30 for additions to power plant, including 1500-kw. turbine generator and accessories; one 750-hp. boiler, with superheater, soot blowers, accessories, stoker with forced-draft fan equipment, combustion control apparatus, gages and instruments, pip-

ing, etc.; one deaerating feedwater heater, capacity 210,000 lb. per hr., with accessories, equipment and piping; two 600-gal. per min. boiler-feed pumps, turbine-driven, with auxiliaries and instruments; one zeolite water-softening equipment; improvements in ash-handling equipment; 50-ton steam-driven refrigeration ammonia compressor, with condensers, receivers, gas purger and accessories.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Sept. 23 for 50 aluminum or steel corrosion resisting steam-jacketed kettles, each with capacity of 20 gal., for Sewall's Point, Va., yard; 15 and 40 similar kettles, 40-gal. and 20-gal. respectively, for Mare Island Navy Yard (Schedule 8574).

The South

• **Taggart Corp.**, 230 Park Avenue, New York, kraft paper products, paper bags and containers, etc., plans new converting mill at Franklin, Va., for manufacture of heavy-duty paper bags for handling chemicals, building materials, etc. Cost about \$500,000 with equipment. New mill will be located near plant of Chesapeake-Camp Corp., Franklin, kraft wrapping and other paper stocks, which will furnish paper for converting plant. Latter company will make extensions in mill, including additional machinery, for this production. Cost over \$600,000.

Water Department, Portsmouth, Va., plans expansion in waterworks station, with installation of two large motor-driven pumping units and accessories, two gasoline engine-driven generator sets and auxiliary equipment; also two new elevated steel storage tanks and towers, 1,000,000 and 500,000-gal. capacity, respectively. Cost about \$500,000. Financing in that amount has been arranged through Federal aid.

Carnation Co., 715 North Van Buren Street, Milwaukee, condensed and evaporated milk, etc., plans new one-story processing plant for production of evaporated milk at Dadeville, Ala. Cost over \$160,000 with equipment.

United States Engineer Office, Wright Building, Tulsa, Okla., plans one-story machine and motor repair shop, 76 x 240 ft., at Will Rogers airfield, near Oklahoma City, Okla.; also one-story oil storage and distributing building, 60 x 153 ft., same field, with tanks and other equipment.

War Department, Washington, has let contract to Ford, Bacon & Davis, Inc., 39 Broadway, New York, engineer and contractor, for new ammunition-loading plant at Jacksonville, Ark., including shops, power house, pumping station and other structures. Cost about \$21,297,000. Fund in that amount will be provided by Defense Plant Corp., Washington.

Christian-Carpenter Drilling Co., Gulf Building, Houston, Tex., plans new gas recycling plant for natural gasoline production in Joyce Richardson field, about 18 miles from city, comprising several production units, compressor station, pumping plant, steel tank storage units and other facilities. Cost about \$170,000 with machinery.

Central States

• **Herring-Hall-Marvin Safe Co.**, Grand Boulevard, Hamilton, Ohio, has let general contract to Antenen Engineering Co., East and Hanover Streets, for two one-story additions, 50 x 170 ft. and 77 and 85 ft., respectively. Traveling crane will be installed. Cost close to \$125,000 with equipment.

Ohio Edison Co., Youngstown, Ohio, has approved plans for expansion in steam-electric generating station at Toronto, Ohio, including new 40,000-kw. turbine-generator unit and accessories, high-pressure boiler and auxiliary equipment. Turbine unit has been awarded to Westinghouse Electric & Mfg. Co., East Pitts-



Magnesium FOR DEFENSE

To manufacture magnesium metal for defense, the United States Government has commissioned Basic Refractories, Incorporated, through a subsidiary, Basic Magnesium, Incorporated, to build and operate in its behalf a \$70,000,000 group of producing plants in Nevada near Boulder Dam which will utilize the company's extensive magnesite deposits. These plants will produce 112,000,000 pounds of magnesium annually.

Basic Refractories, Incorporated welcomes this opportunity to contribute to the common effort toward maintaining the cherished ways of life of the Anglo-American world. At the same time it desires to acknowledge the fact that the steel industry of the United States, upon which this company is dependent, is essentially responsible for this great new Defense project.



BASIC REFRactories, INCORPORATED

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SALES POSSIBILITIES

burgh. Contracts for other equipment will be placed soon. Cost close to \$3,500,000.

Warner & Swasey Co., 5701 Carnegie Avenue, Cleveland, plans one-story addition for production of machine tool equipment for government. Cost about \$550,000, fund in that amount to be secured through Defense Plant Corp., Washington. Osborn Engineering Co., Euclid Building, is architect and engineer.

Empire Brass Co., 10301 Berea Road, Cleveland, plumbers' brass goods, has asked bids on general contract for one-story addition, about 50 x 100 ft. Cost close to \$45,000 with equipment.

Buckeye Brass & Aluminum Co., Tiffin, Ohio, brass, bronze and aluminum castings, etc., plans one-story addition for expansion in foundry. Cost over \$40,000 with equipment. Herman Kuhn, Tiffin, is engineer.

Jack & Heintz, Inc., Hanna Building, Cleveland, plans one-story plant for production of electric aircraft starters for government. Cost about \$146,000. Fund in that amount will be secured through Defense Plant Corp., Washington.

Belden Mfg. Co., 4647 West Van Buren Street, Chicago, insulated wire and cables, etc., is erecting one-story addition to branch plant at Richmond, Ind., totaling over 30,000 sq. ft. of floor space. Cost close to \$200,000 with equipment.

Hans Machine Works, Siketon, Mo., plans one-story addition, 60 x 120 ft., for expansion in machine shop. Cost about \$45,000 with equipment.

J-M Service Corp., recently organized subsidiary of Johns-Manville Corp., 22 East Fortieth Street, New York, will begin work at once on new shell-loading plant for government at Parsons, Kan., including power house, shops, administration building and other structures. Joint contract for construction has been let to Peter Kiewit & Sons, Omaha National Bank Building; George W. Condon, Eighty-fourth and Loveland Streets, both Omaha, Neb.; and Paschen Brothers Construction Co., 221 North LaSalle Street, Chicago. Cost over \$20,000,000 for land, buildings and machinery, fund in that amount to be furnished by Defense Plant Corp., Washington. Consoer, Townsend & Quinlan, 211 West Wacker Drive, and Battey & Childs, 231 South LaSalle Street, both Chicago, are architects and engineers.

Briggs Mfg. Co., 11631 Mack Avenue, Detroit, automobile bodies, plumbing fixtures, etc., has let general contract to W. E. Wood Co., 4649 Humboldt Street, for one-story addition. Cost over \$65,000 with equipment.

Bohn Aluminum & Brass Corp., Lafayette Building, Detroit, plans new branch plant at Adrian, Mich., for production of aircraft parts for government. Cost estimated at \$596,460, of which about \$371,620 will be used for equipment purchases. Company also will build new one-story plant at Detroit for like production, to cost about \$289,100. Appropriations in amounts noted will be secured from Defense Plant Corp., Washington.

Burroughs Adding Machine Co., 6071 Second Street, Detroit, has let general contract to Esslinger-Misch Co., 159 East Columbia Street, for one-story addition, 65 x 600 ft., to branch plant at Plymouth, Mich. Cost over \$250,000 with equipment. Albert Kahn Associated Architects & Engineers, Inc., New Center Building, Detroit, is architect and engineer.

Kaydon Engineering Corp., Muskegon, Mich., A. Harold Fraenthal, president, recently organized to manufacture special anti-friction equipment, has taken over a local one-story building and will remodel for plant. Initial output will be for ordnance for Navy Department, Washington.

Industrial Spring Co., 1717 North Ashland Avenue, Chicago, steel springs, etc., has purchased one-story building at 1632 North Wells Street and will remodel for plant. One-story addition is being erected for office. Present works will be removed to new location and capacity increased.

Chicago Metal Hose Co., 1315 South Third Street, Maywood, Chicago, flexible metallic

hose and tubing, has asked bids on general contract for one-story addition, 111 x 430 ft. Cost over \$180,000 with equipment. Engineering Systems, Inc., 221 North LaSalle Street, Chicago, is architect and engineer.

W. F. & John Barnes Co., Inc., Rockford, Ill., drilling, boring and tapping machines, parts, plans new one-story plant on local site for production of mechanical equipment for government. Cost about \$2,000,000, fund in that amount to be secured through Defense Plant Corp., Washington, for land, buildings and machinery.

A. O. Smith Corp., 3533 North Twenty-seventh Street, Milwaukee, has asked bids on general contract for two one-story additions, 200 x 600 ft. and 300 x 400 ft., for production of aircraft parts for government. Fund of \$2,760,000 will be secured through Defense Plant Corp., Washington, majority of fund to be used for purchase of equipment.

John Deere Plow Works, Inc., Moline, Ill., agricultural implements, a subsidiary of Deere & Co., same address, has let general contract to F. J. Kirchhof Construction Co., 700 Lawrence Street, Denver, for one-story and basement factory branch, storage and distributing plant, 114 x 162 ft., at 3375 Brighton Boulevard, Denver. Cost close to \$150,000 with equipment. Fisher, Fisher & Hubbell, Denver National Building, Denver, are architects; Dornmann & Anderson, last noted address, are consulting engineers.

City Council, Durant, Iowa, asks bids until Sept. 30 for new municipal power plant, including two diesel engine-generator units with combined rating of 350-kw., and third unit of 75-kw. capacity, with auxiliary equipment. Cost about \$115,000. Stanley Engineering Co., Muscatine, Iowa, is consulting engineer.

Pullman-Standard Car Mfg. Co., 79 East Adams Street, Chicago, plans expansion in plant at 11001 South Cottage Grove Avenue for production of equipment for government. Cost about \$285,150. Fund in that amount will be secured through Defense Plant Corp., Washington.

Western States

Consolidated Aircraft Corp., 3302 Pacific Highway, San Diego, Cal., airplanes and parts, has let general contract to Edward F. Bryans, 3401 Granada Street, for one-story addition, 200 x 235 ft., for expansion in experimental division. Cost close to \$200,000 with equipment. Edward C. and Ellis W. Taylor, 803 West Third Street, Los Angeles, are architects and engineers.

Bureau of Reclamation, Denver, asks bids until Sept. 24 for 18 102-in. conduit tube valves for installation in river outlets at Shasta dam, Central Valley project, Cal. (Specification 991); until Sept. 29 for three 25,000-kva., 6500-volt, vertical-shaft, a.c., electric generating units for Keswick hydroelectric generating station, Kennett Division, same project (Specification 992).

Public Works Officer, Room 816, Exchange Building, Seattle, asks bids until Sept. 24 for one-story addition to machine shop, 124 x 300 ft., and for one-story foundry, 61 x 121 ft., at Keyport, Wash., naval station (Specification 10602).

Douglas Aircraft Co., Inc., 3000 Ocean Park Boulevard, Santa Monica, Cal., plans expansion for production for government, comprising one-story addition to local works or erection at another location, now being determined. Cost about \$522,100. Fund in that amount will be furnished by Defense Plant Corp., Washington.

Stuart Oxygen Co., 211 Bay Street, San Francisco, industrial oxygen, etc., plans one-story addition. Cost close to \$50,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Sept. 23 for one motor-driven universal tool and cutter grinder (Schedule 8588) for Mare Island Navy Yard; 37 ventilating equipments with motors, controllers and spare parts (Schedule 8583), three woodworking lathes, 12-in. swing (Schedule 8613), four tool and cutter grinders

(Schedule 8606), all motor-driven, for Puget Sound Navy Yard; until Sept. 25, one hydraulic gear grinder (Schedule 8628), one self-contained, 3-in., bevel gear generator (Schedule 8639), both motor-driven, for Keyport, Wash., naval station.

Canada

Ottawa Car & Aircraft, Ltd., Slater Street, Ottawa, Ont., airplanes and parts, is erecting three-story addition, 70 x 140 ft., for which general contract recently was let to Doran Construction Co., Ltd., 73 Bank Street. Cost close to \$200,000 with machinery.

Noordyn Aircraft, Ltd., Cartierville, Que., plans two one-story additions for expansion in parts production and assembling departments. Cost close to \$100,000 with equipment. L. & P. Amas, 133 Commissioner Street, Montreal, are architects.

Canadian Acme Screw & Gear, Ltd., Weston Road, Toronto, has purchased seven acres adjoining its plant, and will erect a factory to provide 100,000 sq. ft. of floor space for manufacture of shell cores, etc. Cost about \$150,000 with equipment.

Union Gas Co. of Canada, Ltd., Sarnia, Ont., has awarded general contract to Robertson Construction & Engineering Co., Ltd., for a gas purifying plant, compressor station, etc., to cost \$1,000,000 with equipment.

Standard Cycle Products, 407 Logan Avenue, Toronto, has awarded general contract to R. J. Hibbs Construction Co., 15 Trent Avenue, and other trades, for plant addition to cost \$50,000.

Morton Engineering & Dry Dock Co., West End Louise Embankment, Quebec, has plans for plant addition, to cost about \$100,000 with equipment.

S. & S. Aircraft, Ltd., 215 Watt Street, Winnipeg, Man., has awarded general contract to H. E. Gibson & Co., 631 Strathcona Avenue, for plant addition to cost \$90,000.

Canadian Car & Foundry Co., Ltd., 621 Craig Street West, Montreal, will erect addition to aircraft division of plant to cost, with equipment, about \$100,000. Architects are Spence Mathias & Burge, 2063 Union Street.

Trade Notes

The Lyon Iron Works, Greene, N. Y., manufacturer of material handling equipment, has changed its name to Lyon-Raymond Corp.

Robert Joseph, Inc., stockholders have changed the name of the corporation to Ferrotar Corp. and combined the production of brass and bronze ingots with the company's activities in iron, steel, and chemical products including scrap iron and metals. Offices are at 80 Broad Street, New York.

W. K. Millholland Machinery Co., 1048 Fairfield Avenue, Indianapolis, machinery sales division, has been appointed sales agent in the Indiana territory for Murcley Machine & Tool Co., Detroit, maker of die heads, chasers, taps, planetary thread millers and threading machines. The Millholland company designs and builds special production machinery.

Barium Stainless Steel Corp., Canton, Ohio, has leased the plants and machinery of Precision Mfg. & Engineering Co., New Philadelphia, in order to fill a \$2,717,446 War Dept. contract for metallic links for 0.50 cal. machine gun bullets.

D. Saunders' Sons, Inc., Yonkers, N. Y., manufacturer of pipe threading and cutting machinery, has leased its plant and business to Saunders Machine & Tool Corp. which will manufacture, in addition, machine tools of various kinds.